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Canada Views Pulpwood Cut as Favorable

Objective Sought Is In Sight To Maintain Supply of Newsprint To U. S. and Overseas—Chemical Pulp Output In 1944 Met Essential Needs — Would Reopen Idle Quebec Mills — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 26, 1945—Summarizing business news from its hundreds of branches throughout Canada, the Bank of Montreal, in its monthly letter, strikes an optimistic note regarding the cut of pulpwood this season, and says the objective aimed at is in sight.

Woodcutting operations, it is pointed out, got off to a good start last fall as a result of a substantial increase in the labor force employed in such work.

Since most of the woodcutters have remained on the job, the letter adds, the cut of pulpwood at the end of January was well ahead of that on the same date a year ago.

With reasonably favorable weather conditions, it continues, there is an excellent prospect for the attainment of the objective set by the Canadian pulp and paper industry of a winter's cut of 7,000,000 cords of pulpwood, which would be a gain of a million cords over last season's cut.

If the objective thus foreshadowed is attained it will mean not only that the supply of newsprint to the United States and to overseas markets can be maintained at the level now prevailing, but also the large exports of the various kinds of pulp that have been going to the same markets. Last year, due principally to the shortage of pulpwood, the production of mechanical was considerably below normal capacity, while that of chemical pulp was 3½% short of production in 1943, which latter production, by the way, considerably exceeded any previous peak year.

Position Regarding Mechanical Pulp

In 1945 approximately 70% of Canada's available surplus supply of mechanical pulp was shipped to the United States and 20% to the United Kingdom. At the end of the year it was officially reported that inventories of ground wood at the producer mills, with the exception of some tonnage accumulated for shipment overseas, had been reduced practically to tonnage being loaded into cars for immediate shipment, indicating that groundwood producers are making every effort to contribute their share of woodpulp to the market. There is still a serious shortage of groundwood everywhere, and the continued and increasing scarcity of old papers has increased the demand for groundwood, especially from box board mills, while from the United States comes the report that it will be many months before the supply will be sufficient to take care of the existing demand.

As to chemical pulp, Canadian manufacturers are rather proud of the fact that in 1944 they met all essential war needs fully, regularly, and on time. Shipments to the United Kingdom were again increased by a sizable amount, Canada continuing to supply somewhat in excess of 70% of United Kingdom pulp consumption. War needs from Australia, New Zealand, South Africa, India, and some Latin-American countries, unusual markets for Canadian shippers, were also taken care of. Shipments to the United States, although slightly less than in 1943, were maintained at almost double the immediate pre-war level, despite shipment to the United Kingdom from Canada of tonnage that normally would have been shipped by United States producers.

In fact, F. G. Robinson, chairman of the Chemical Pulp Section of the Canadian Pulp and Paper Association, says, "All branches of the industry evinced in practical fashion quick recognition of problems and ready action in their solution, to the end that this significant contribution to the over-all war effort of the United Nations be accomplished." He has also put on record, "with much satisfaction," continuance of collaboration with the United States Pulp Producers Association and the American Paper and Pulp Association in the realistic way that has made available to all factual data on a more comprehensive basis and at less over-all cost than otherwise would have been possible. "Without such data," he says, "it is impossible to chart any intelligent course of action."

Waste Paper Need Acute

Probably reflecting winter weather and zero temperatures during the past few weeks—now alleviating—waste paper has become scarcer through the slowing down of collections. According to a bulletin of the salvage division of the Department of National War Services, paper mills are operating on reduced time, owing to the shortage. Renewed appeals are therefore being directed to all local salvage committees throughout the Dominion to speed up collections.

Would Reopen Idle Quebec Mills

Once again the long idle mills of the Quebec Pulp and Paper Corporation at Chicoutimi, Que., are in the limelight. These mills are now in the hands of a trustee, the company having been put into bankruptcy in November, 1942, by the Quebec Government, due to default on heavy commitments for water rentals. At the present session of the Quebec Legislature the Hon. Antonio Talbot, member for Chicoutimi, has inscribed on the order paper of the Assembly notice of motion for a bill respecting the reopening of the

(Continued on page 18)

Sangamon Paper Co. Defers Rebuilding Plan

Inability To Obtain Paper Mill Machinery Causes Abandonment of Kaukauna Project—Forest Laboratory Solving War Packaging Problems—Mill Permitted to Serve Free Lunches—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., February 26, 1945—Because the Sangamon Paper Company at Kaukauna, Wis., has found it impossible to purchase paper machinery, plans for rebuilding the mill in that city have been abandoned, T. J. Russell, mill manager, announced February 20.

The owners of Sangamon have purchased a mill at Eaton, Ind., formerly owned by the Ball Brothers, which was manufacturing straw paper, Mr. Russell said. The mill, which he declared is well equipped with a machine shop and other facilities, is turning out 40 tons per day and will be converted to make corrugated and bogus craft.

S. J. Cohen, Sangamon president, has tried to obtain machinery for the Kaukauna project in all parts of the country, Mr. Russell said, but has been unsuccessful in his quest. The Kaukauna mill was razed by fire in February, 1944.

Mr. Russell left Kaukauna February 20 for Eaton, where he will manage the newly-acquired mill and make his residence.

Laboratory Solving Many Packaging Problems

Near-miracles in providing packaging for all types of war goods have been accomplished during the last few years at the Materiel Container division of the United States Forest Products Laboratory at Madison, Wis., where a staff of engineers, chemists, physicists and shipping experts has solved some important supply line problems.

Its part of their job to make sure that equipment and supplies reach our fighting men on every front—in usable condition and at the utmost economy of space. The crates, boxes and packages they designed for hundreds of items had to be ready for the arctic or the equator; to resist corrosion from salt air, the steaming jungles, the heat of deserts and brittle cold. The containers had to be light, compact and tough. Sometimes they had to be thrown overboard and dragged ashore, where they lay for weeks in the open.

The researchers were so successful in their efforts for compactness that at the end of the first year of the war Brigadier General J. S. Hatcher, chief of the ordnance field service division of the army, announced that four ships were carrying the weapons which formerly had filled five vessels of equal size. The Laboratory estimated that in 1943 savings amounted to more than 1,250,000,000 board feet.

The division has a staff of 130 technicians, 30 of whom are field men who travel about the country instructing workers in factories in the use of the crates and packages. T. A. Carlson is chief of the division.

Foremen's Club Meets

The Kimberly Mill Foremen's Club, Kimberly, Wis., will meet at 7:30 Monday evening, February 26, with foremen of other Kimberly-Clark Corporation mills as guests. DeLoss Walker, Chicago, spoke on "Victory From Main Street." For eight years Mr. Walker was an associated editor of Liberty Magazine.

Corporation officials invited to the meeting included Cola Parker, president; Ernst Mahler, executive vice president; S. F. Shattuck and Henry Boon, vice presidents; W. F. Kellet, general superintendent; Fred Seaborne, staff superintendent, and J. C. Simonich, personnel director.

Sponsors Red Cross War Fund

The Portage, Wis., County's 1945 Red Cross War Fund campaign will be conducted under the sponsorship of the Whiting-Plover Paper Company, it was announced last week by Ralph B. Lillie, president of the chapter.

The general chairman of the drive is J. H. Miller, Whiting-Plover vice president and general manager. He has appointed Richard Brady and Thomas Leech as executive co-chairmen.

"Company-sponsored drives have proved exceptionally successful in many communities," Mr. Lillie said. "It is our plan to ask other local firms to conduct future fund raising campaigns. The American Red Cross is very grateful for the splendid cooperation evidenced by the Whiting-Plover Paper Company and its employees in sponsoring this all-important wartime activity."

Appleton Wire Works Adding Facilities

An L-shaped locker, shower and rest room for women employees at the Appleton Wire Works, Appleton, Wis., is under construction. Work is expected to be completed in several weeks. The brick structure will have a 900 square foot area.

Mill Permitted to Serve Free Lunches

Kimberly-Clark Corporation, Neenah, Wis., has been granted permission by the regional war labor board to furnish free lunches to employes required to work 16 consecutive hours. Permission was required under manpower regulations which define anything given free to employees as constituting an increase in pay. Kimberly-Clark has given free lunch to employees working beyond shift hours for a considerable number of years, but the permission was sought to comply with the rules.

Dr. Yap to Address School Program

Dr. Diosdado M. Yap, editor and publisher of Bataan, independent Philippine news magazine and one of Washington's leading consultants of the Far East, with special reference to American-Philippine relations, will be the principal speaker at the second 1945 Twin City Safety school program Tuesday evening, February 27, at the Neenah High School, Neenah, Wis. He will discuss American policy in the Pacific.

Argentine Casein Exports High

WASHINGTON, D. C., February 26, 1945—Argentina's exports of casein increased more than 600% during the first 6 months of 1944 over the corresponding period in 1943, says a report to the Department of Commerce. Comparable figures are given at 17,700 and 2,900 tons, respectively.

Chicago Concerned About Costs and Profits

Relief Granted To Certain Lines Considered Inadequate To Effect Equitable Balance In Increasing Costs of Operation—Waste Paper Collections Lagging — Sprott Describes Forestry Work In Texas.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., February 26, 1945—That segment of the paper industry which confidently believed it was "prospering" during the past year is now waking up to the fact that a good deal more "squeezing" of profits has been experienced than they had thought. Financial statements and individual comments indicate that the industry is completely out of balance as far as its profit position is concerned and that any measurable decline in business would find the industry in a serious condition. What relief has been granted to certain lines by the OPA and WPB has proven inadequate to meet the increased costs of operation. Even more disturbing is the tendency of OPA and WPB to expedite production not by increasing prices at the point of final consumption but by asking various factors of production, wholesaling and distribution to "absorb" such increases on a basis of nationwide averages.

Even the critical nature of the "financial" side of the trade cannot match the hectic worries which are consuming the time of an industry which is doing a magnificent job of supplying the War effort and a surprising amount of civilian trade as well! At present there is no particular point of difference between the status of any line or grade of paper. All grades are being consumed to the point of extinction and those which were formerly "lowly substitutes" are now being made use of in ways undreamed of a few years ago.

Waste Paper Salvage Lagging

Waste paper collections have not come up to expectations and pulp shortages and closing of European markets have simply combined to make the present position almost untenable except for the fact, as one paper merchant put it, that "the industry has a job to do and it will do it."

Describes Forestry in Texas

Charles H. Sprott, forester of the Southland Paper Mills of Lufkin, Texas, has an interesting article which appears in a current issue of the Chicago Journal of Commerce. Mr. Sprott makes the point that inasmuch as our forests are our only renewable natural resource, it is only sound economy to keep them in good growing condition and fully stocked. He adds that the demands of war have drawn heavily on our forest reserves and that "at present we are cutting more timber than we are growing." He points out that the East Texas forests are in general understocked and producing at less than half of their potential capacity because of fires and ruthless logging practices of both the past and the present. Some 5,000,000 gross acres within the timber belt there are not in the fire protection units. The article also states that while the paper mills have been severely criticized for methods of cutting, not all of the criticism should be placed on the mills "as the timber owners usually state the way they wish their timber cut."

During last Winter's ice storm, Mr. Sprott reported, the paper mills in the East Texas area were in a position to render assistance by salvaging the damaged pine timber which was largely unfit for other wood products. "The method of harvesting pulpwood lent itself to these distorted forests," writes Mr. Sprott. "At present our pulpwood operations still depend largely in East Texas on the cross cut and one man pulpsaw for producing the wood. Trees are felled and usually limbed, topped and bucked up in the woods into four or five foot lengths."

Mr. Sprott adds that fire burns over an average of 183,078 acres or 286 square miles annually, based on the five year period from 1939 to 1943, even within the Texas forest service protection units.

Celebrates 25th Birthday

Deservedly popular in the Chicago area is the 25th Anniversary (February) issue of the American Paper Merchant of which Phil Howard is the publisher. The issue carries an interesting chronological record of happenings in the industry during the 25 year period and provides a valuable "backwards glance" on which to base plans for the future. The accounts are full of names and personalities and the history, beginning with a nationwide paper drive back in 1920, carries an excellent continuity up to the present date! Mr. Howard makes a strong plea for the industry to make full use of the lessons taught and to bend every effort to reforestation as the number one problem of the industry.

The 118 page issue's historical account is divided into five periods, namely, "The Rainbow—1920 to 1924"; "The Wave—1925 to 1929"; "Dust—1930 to 1934"; "Thunder—1935 to 1939" and "The Storm—1940 to 1944." The titles form a very good description of these periods in American business life. Also in the issue are "Glances at the Industry's Future"; the "Place of Paper in the War Effort" and an editorial or two which would be good for any industrial leader in any industrial line to read and profit by.

To Build New Research Lab.

A new research laboratory will be constructed in Brecksville, Ohio, by the B. F. Goodrich Company, it is announced by John L. Collyer, company president.

The laboratory will be built on a tract of land on the Cleveland-Akron highway. Brecksville is 20 miles from the company's operations in Akron.

"The company's heavy responsibility in the war effort, bringing additional demands upon the research division, make it advisable to establish this activity in a new location as present laboratory facilities are overtaxed. The decision to locate this important activity in Brecksville was made after thorough consideration of a number of other available sites," Mr. Collyer said.

Architects have completed principal plans and designs and construction work will be started as soon as possible, according to Dr. H. E. Fritz, company research director.

Obituary

Joseph E. Talton

Joseph E. Talton, superintendent of the sulphate pulp mill of the Southland Paper Mills at Lufkin, Texas, died at the Scott-White Clinic at Temple, Texas, February 2.

At the age of 42 Mr. Talton had become one of the outstanding sulphate pulp mill men in the South. Among the many ideas he had developed for the improvement of quality and production in kraft mills, he invented and patented the Talton Reflux System for multiple effect black liquor evaporators, increasing the capacity approximately 20%.

Mr. Talton was born in Selma, N. C. After graduating from high school, he entered Wake Forest University winning his letters for three years on the varsity football team as end and also for two years on the basketball team. He began his pulp mill experience in 1928 with the Hummel-Ross Fibre Company in the bleach plant and later as sulphate cook and recovery room foreman, and operator. He left the Hummel-Ross Company in 1936 to go with the Union Bag and Paper Company at Savannah, Ga. where he was evaporator operator and later foreman of two pulp machines. In 1937 he went to Crossett, working first as evaporator operator, then cook and later as pulp mill tour foreman. It was while holding this last position that he developed the Reflux System and put it into operation in that mill of which he later became pulp mill superintendent. In 1941 he went to Lufkin, Texas during the building of the pulp mill for the Southland Paper Mills of which, on its completion, he became superintendent. Mr. Talton has been in complete charge of the pulp mill and bleach plant ever since and it is said that the fact that today the pulp produced at Southland is of the highest quality and the pulp mill producing beyond its designed capacity, is due to his untiring efforts.

Mr. Talton is survived by his widow, Lena Elizabeth (Bobbitt) and four daughters.

Francis E. Bentley

The Noble & Wood Machine Company announces with deep regret the death of one of its most valued employees, Francis E. Bentley, at his residence, 55 Wilder avenue, Hoosick Falls, N. Y. February 13 after an illness of several weeks.

He was born August 13, 1900 in Cambridge, N. Y., son of the late Gardner A. and Margaret Decker Bentley. He attended district school in Eagle Bridge and later entered Hoosick Falls High School where he was graduated in the Class of 1919.

He entered the employ of The Noble & Wood Machine Company in 1924 as field representative, and, being of a congenial disposition and manner, "Jim" Bentley, as he was known to his many friends, leaves a host of friends throughout the paper trade territory he covered, which included New England and the Southern Coastal States.

He was a member of Van Rensselaer Lodge No. 400, F. and A. M.; Raymond Chapter No. 248, R.A.M. and the Eagle Bridge Methodist Church.

Survivors include his widow, the former Charlotte K. Knowles of Taunton, Mass., and a 15 year old daughter, Virginia.

Funeral services were held at the residence February 15 at 2:30 P.M. by the Rev. Mark Kelly, Pastor of the Village Methodist Church. Interment in Maple Grove Cemetery.

William Henry Ryan

William Henry Ryan, aged 71, died at 4:15 Saturday afternoon, February 17, at his home at Appleton, Wis., after a year's illness. He was affiliated with Kimberly-Clark Corporation, Neenah, Wis., for 48 years, serving as a director at the time of his retirement in 1937. He also was a director of the Old Line Life Insurance Company of America and a trustee of Lawrence College, Appleton, Wis. He founded the Appleton Symphony Orchestra and was a director and former president of the King's Daughters Foundation of the Infant Welfare Circle, Appleton.

For 19 years he lived at Niagara, Wis., but with this exception lived in Appleton all his life. He was born in the latter city February 28, 1873. He was a graduate of the Appleton public schools and of Lawrence College. He was a member of the First Methodist church, Appleton; the Masonic lodge of Niagara; the Royal Arch chapter and Commandery of Marinette, Wis.; Tripoli Shrine and the Royal Jesters of Milwaukee; the Elks and the Knights of Pythias. Survivors are the widow and two sisters.

Harry C. Brown

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 26, 1945—The death is announced of Harry C. Brown, prominent Canadian electrical engineer.

At the time of his death he was associated with the Crossett Paper Company, of Crossett, Ark., in charge of post-war planning, and formerly, he was with the International Paper Company in New York for many years, and the Newfoundland Paper and Power Company at Cornerbrook.

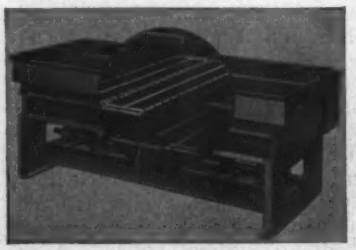
He is survived by his wife, formerly Marion Watson, of Seaforth, Ont., and several brothers and sisters at Moncton, N. B., where the funeral was held.

Jasper J. Jones

Jasper J. Jones, very favorably known in the trade as a salesman for Arnold-Roberts Company, Boston, Mass., died recently. His territory was the South Shore, including Brockton and Whitman. His home was in Whitman. Mr. Jones was unmarried. His mother, sister and brother are living.

Speeds Up Cleaning of Screen Plates

Illustrated here is another improvement to aid mill production by speeding up cleaning and repairing screen plates, also aiding in the production of cleaning pulp. Designated as the "Murco" Screen Plate Hold Down Device, manufactured by D. J. Murray Manufacturing Company, Wausau, Wis. Patent applied for, this new improvement blends itself into a streamlined design, eliminating eddies, etc. in the pulp stream flow that causes vacuum leaks. The illustration is that of an enlarged section.



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W. H. Walpole Heads N. E. Merchants

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 26, 1945—William H. Walpole, secretary and assistant treasurer, Rutter & McNaught, Inc., was elected president of the New England Paper Merchants Association, Inc., at the 40th annual meeting of the organization, at the Parker House Tuesday, February 20, with 63 present. Other officers elected were James J. Dwyer, vice-president, Stone & Forsyth Company, first vice-president; Paul M. Jones, secretary, Storrs & Bement Company, second vice-president; Frank B. Cummings, treasurer, and F. Bendel Tracy, president and treasurer, Fort Hill Paper Company, secretary.

Directors were elected as follows: Richard B. Anderson, president, Whitney-Anderson Paper Company, Inc., Springfield; Floyd H. Blackman, president, D. F. Munroe Company; Charles A. Esty, president, Carter, Rice & Co.; Donald Gibbs, assistant treasurer, Kendall Paper Company, Cambridge; Samuel L. Ginsburg, president, Ginsburg Brothers, Inc., Somerville; Carl J. Knutson, sales manager, H. J. Dowd Company, Inc., Cambridge; Hubert W. Lockhart, president and treasurer, Von Olker-Snell Paper Company; Alfred W. Logan, general manager, Providence Paper Company, Providence; Frank H. Merrill, president and treasurer, Andrews Paper Company; Leon M. Poore, treasurer and general manager, John Carter & Co.; Harold R. Robinson, president, C. H. Robinson Company, Portland, Me.; Sterling R. Chatfield, secretary and assistant treasurer, Minotte E. Chatfield Company, New Haven, Conn.; and Charles A. Shaw, president, Whitney Brothers.

WILLIAM H. WALPOLE

Honor was paid to Arthur M. Burr, oldest living former president of the association, who was not able to be present because of illness. Flowers and a card signed by all those present were sent to Mr. Burr as an expression of appreciation for his services to the industry.

President Samuel L. Ginsburg of Ginsburg Brothers, Inc., Somerville, Mass., called the meeting to order after the dinner.

Annual reports of President Ginsburg, treasurer Frank B. Cummings, and managing director Walter R. Guild were read.

The nominating committee, composed of F. Bendel Tracy, chairman, J. R. Halkyard and Charles Charnella presented the slate of officers who were elected, to take office March 1.

W. G. Leathers, assistant secretary of the National Paper Trade Association of the United States, spoke on subjects of current interest to the trade. He read the results of a questionnaire which gave the opinions of 30 paper merchants on probable conditions in the industry during the next year.

The technicolor moving picture, "Combat America," with Clark Gable as narrator, concluded the evening's program.

Farrel-Birmingham Buys Atwood

Farrel-Birmingham Company, Inc., of Ansonia, Conn., and Buffalo, N. Y., manufacturer of heavy industrial machinery and equipment, has announced the purchase of the Atwood Machine Company of Stonington, Conn., pioneer manufacturer of textile machinery.

This transaction unites two old and highly respected firms, bringing together nearly two centuries of experience in machine design and construction. Farrel-Birmingham's history dates back to its establishment in Connecticut's Naugatuck Valley in the year 1836, while the Atwood Machine Company was founded in 1852.

Franklin R. Hoadley, who has been president and treasurer of the Atwood Machine Company for the past eight years, will succeed John W. Haddock as president of Farrel-Birmingham Company. Mr. Hoadley has been associated with the Farrel-Birmingham firm since his graduation from Yale in 1914. He was foundry manager for a number of years, vice president from 1930 to 1936, and has been a director since 1923.

Farrel-Birmingham Company will continue to build Atwood textile machinery at the Stonington plant, and will maintain the engineering, production and sales services of Atwood's 93-year old organization. W. M. Fraser, formerly vice president, has been made general manager of the Atwood plant. No other changes in the organization are contemplated.

Pulpwood Sales Make Record

Sales of timber and pulpwood in the central forest region in 1944 were the highest on record, Forester Jay H. Price announced recently. He said that $28,435 had been turned over to the state treasurer of Wisconsin in accordance with the federal law which requires that 25 per cent of the gross receipts of the national forests be divided among the counties, based on their national forest acreage. An additional 10 per cent of the gross receipts are expended to maintain roads within the forests.

The Wisconsin State Conservation department is again making trees available at a low cost to private land owners, for reforestation purposes. The state encourages private enterprise in reforestation, but prohibits the use of the trees for ornamental or landscape purposes.

The trees are intended to be used in establishing a forest, to improve one already in existence, and for windbreaks and shelters. The owner must agree to protect the trees from fire, trespass and grazing, and must not resell or move the trees until they are large enough for merchantable products. Cost varies from $2 per 1,000 for two-year-old seedlings to $5 per 1,000 for four-year-old transplants. Orders are not accepted for less than 500 trees.

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Standard—Lump; Ground, 99% thru 8 mesh, 95% thru 10 mesh; Powdered, 95% thru 100 mesh.

Iron Free—Lump, approx. 2½"; Ground, thru 8 mesh.

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Solutions: From 38°—60° Baume — Wt. Ratio (Na_2O to SiO_2) from 1:2.00—1:3.40

Appearance: Opalescent to clear.

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Ontario Paper Co. $1,000 Award

The Ontario Paper Company, Limited of Thorold, Ont., announces that it offers a prize of $1,000.00, to be made through the Technical Section of the Canadian Pulp and Paper Association, for the best method proposed for the utilization of a substantial portion of poplar and/or birch fiber in making newsprint paper.

The object of offering the prize is to stimulate ideas and ingenuity leading to the use of as large a percentage as possible of such woods and to improve the quality and economics of newsprint manufacture. Many of our forests today consist of spruce, balsam, birch and poplar and when cut over the birch and poplar are left standing. This not only depletes the forests of presently used species but builds up increasing forest inventory of poplar and birch. A successful method of pulp manufacture using poplar and/or birch would be an important step towards stabilizing and extending the useful life of our forests.

The value of suggestions made will be weighed in direct proportion to the percentages poplar and/or birch usage made possible. It is considered, as an objective, that usage of 40% or higher might be attained.

The award will be made by a committee to be appointed by The Ontario Paper Company, Limited. Decisions as to the award and any interpretation of the rules and regulations governing the award when made by this committee shall be final.

RULES AND REGULATIONS

1. The award will be open for suggestions received before January 1, 1946.
2. The award is not limited to members of the Technical Section, Canadian Pulp and Paper Association, nor to Canadian residents. Executives of the Ontario Paper Company Limited and its subsidiaries, including Quebec North Shore Paper Company, are not eligible. Otherwise submissions from any source will be considered.
3. The winning suggestion, and any other suggestions considered of sufficient merit, together with full submitted details of their application, will be published through the Technical Section, Canadian Pulp and Paper Association. Submission of any suggestion for the award will, by virtue of such submission, give permission to so publish.
4. If the committee does not receive suggestions which it considers of genuine merit, it may decline to grant any award.
5. The Ontario Paper Company Limited does not claim any priority on the rights to the use of either the winning or any other suggestion. The prize is offered to stimulate the use of the woods mentioned in newsprint manufacture.
6. All suggestions and correspondence should be addressed to the Secretary-Engineer, Technical Section, Canadian Pulp and Paper Association, 3420 University Street, Montreal, P. Q. It is requested that three copies of suggestions, preferably typewritten, be submitted.

Southeastern Paper Men Meet

The annual meeting of the Southeastern Paper Trade Association was held January 25 at Rueger's Hotel, Richmond, Va. It was well attended by members from the area and had, as its special guests, Arthur Chamberlin, executive secretary and Willard G. Leathers, assistant secretary, of the National Paper Trade Association.

Officers elected for 1945 were: President, Ernest C. Mead, Richmond Paper Company, Richmond, Va.; vice-president (wrapping), Frank K. Williams, Caskie Paper Company, Lynchburg, Va.; vice-president (fine), Harold S. Hundley, B. W. Wilson Paper Company, Richmond, Va.; secretary, A. R. Leiserson, American Paper Company, Richmond, Va.; treasurer, W. Disney Cole, Epes Fitzgerald Paper Company, Richmond, Va.; assistant to president and editor of Southeaster, Hugh Boyer, Caskie Paper Company, Charlotte, N. C.

A valuable and interesting discussion of broad subjects covering the present and future were led by Messrs. Chamberlin and Leathers, in addition to local matters introduced by various members.

A disastrous fire at the warehouse of the United Paper Company was one of the chief topics of concern in the group and expressions of sympathy and offers of help in any way possible, were prevalent.

Mr. Mead, the new president, stated that he would give serious consideration to the possibility of having a late spring meeting at Sedgefield to replace the association's famous Virginia beach meeting which has been discontinued for the duration.

Chicago Associations Elect Officers

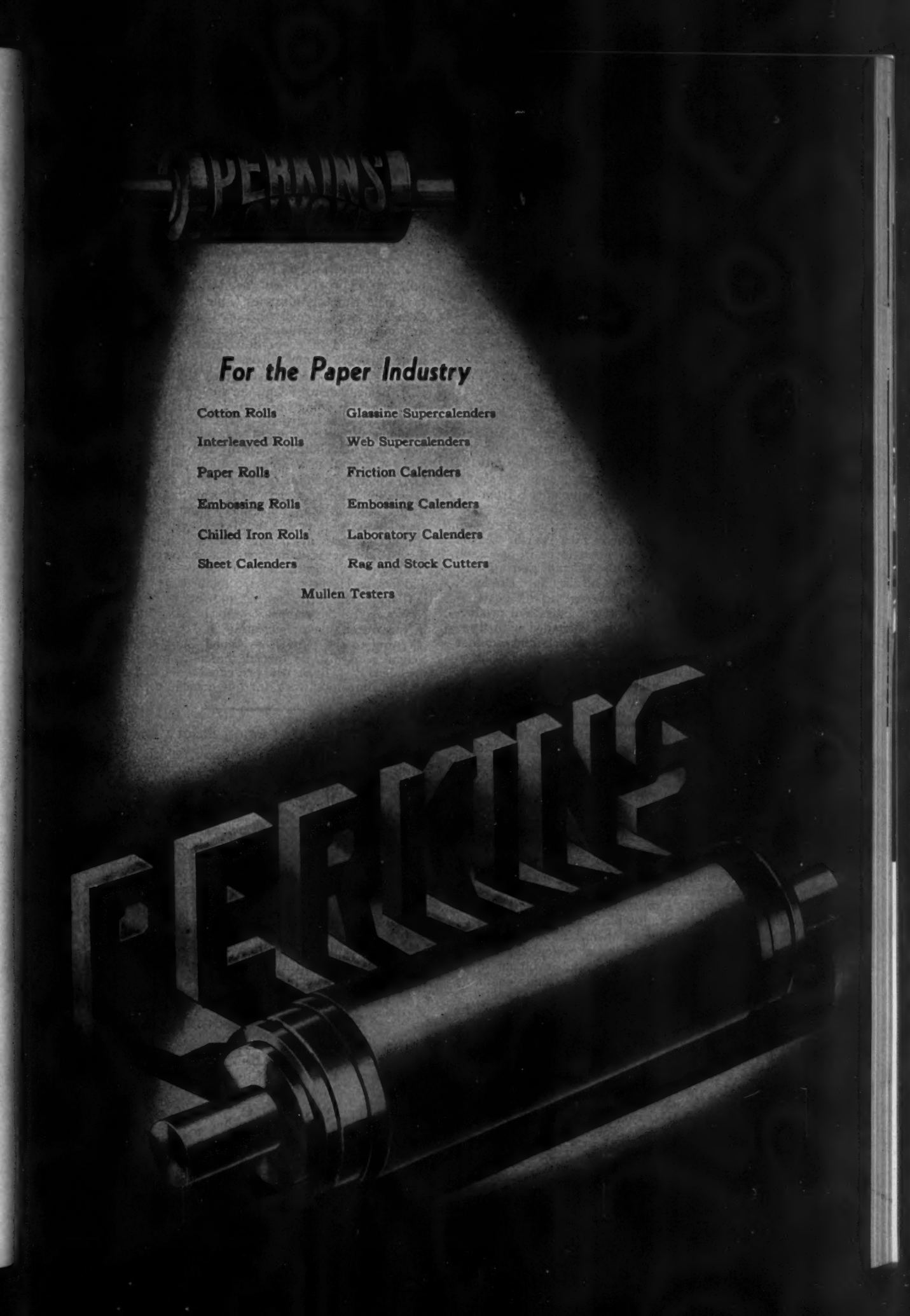
Both the Chicago Paper Association and the Fine Paper Association of Chicago have recently announced new officers for the forthcoming year. The latter organization has elected H. L. Montgomery, vice-president of Berkshire Papers, Inc., as its president and William Shea of Bradner Smith & Co. as vice-president. Other officers include E. D. Buchanan, vice-president of Moser Paper Company, secretary, and Gene Todd, general manager of Bermingham & Prosser, treasurer. Members of the Board in addition to the above who automatically act in that capacity are Gregg J. Frelinger, vice-president of the J. W. Butler Paper Company and W. N. Gillett, president of the Chicago Paper Company.

The Chicago Paper Association recognized an outstanding performance in an unusually hard year by re-electing William S. Knox of Knox & Schneider as its president. Maurice Kay of Randolph Paper and Bag Company, was elected secretary-treasurer, succeeding J. S. Druth of the Chippewa-Arrow Paper Company. Vice-presidents elected were Fred Rudolphy of Hollis & Duncan, Inc., and William Chukerman, veteran Chicago Paper Association member from J. Chukerman & Sons. Included on the board of directors are leaders who have served the Association for many years. They are S. S. Weil, Joseph Weil & Sons, Leo S. Altholz, Inlander-Steindler Paper Company; W. J. Shapland, Fred Rentz Paper Company; Walter Schulman, Levin Brothers Paper Company; L. P. Brown, Atlas Paper Company and Robert Levinson of Eagle Wrapping Products Company.

Maine Mill To Pay Back Wages

CUMBERLAND MILLS, Me., February 23, 1945—Approximately $221,000 in back pay will be distributed tomorrow among nearly 2,000 past and present employees of the S. D. Warren Company paper mill, including some 500 men in the armed forces, Manager John Hyde announced today.

The back pay represents a three cents an hour wage increase granted by the Regional War Labor Board and is retroactive to July 1.


PERKINS
For the Paper Industry
Cotton Rolls
Interleaved Rolls
Paper Rolls
Embossing Rolls
Chilled Iron Rolls
Sheet Calenders
Glassine Supercalenders
Web Supercalenders
Friction Calenders
Embossing Calenders
Laboratory Calenders
Rag and Stock Cutters
Mullen Testers
PERKINS

S. R. Gale To Manage Fort Worth Plant

Oneida Paper Products, Inc., specialty bag manufacturers, announces the appointment of S. R. Gale as manager of the company's new Fort Worth, Texas plant.

Mr. Gale has wide acquaintance among Texas paper merchants, to whom he is well and favorably known. He has been continuously employed in the paper business in Texas since before World War I, serving his apprenticeship as office boy for a paper company in Houston and then advancing to the position of salesman.

Mr. Gale's career in the paper industry was interrupted by service in the Army during the first world conflict, but upon his return to civilian life, he became manager of the paper department of the Stedman Company, serving in that capacity from 1920 until 1930. In 1930 Mr. Gale associated himself with the Pollack Paper and Box Company as manager of the converter-jobber plant in Fort Worth.

Mr. Gale's background and training and his intimate knowledge of the packaging requirements of the Southwest, fit him to assume charge of Oneida's Texas plant, which will be erected soon on 40,000 square feet of property recently acquired from the Frisco Railroad.

The new building, a modern concrete structure, will be located on Stanley Avenue in Fort Worth. Oneida officials say they expect the plant to be in operation before the Autumn of 1945. Completion of this specialty bag factory will give Oneida Paper Products, Inc., superior nation-wide coverage in its fields of operation, company officials state. Sales and production of the new branch will be dovetailed with those of the principal plant in New York and another located in Los Angeles, placing Oneida in position to manufacture and distribute specialty paper bags and other packaging materials expeditiously and efficiently at minimum cost, it is said.

J. L. Fearing, Jr., Leaves International

J. L. Fearing, Jr., who has been connected with International Paper Products Division of International Paper Company for the sale of multiwall shipping sacks, has resigned and left the company.

Graduating from Harvard in 1922, after specializing in engineering and geology, he spent six years in geological and occasional geophysical work in the West and in Mexico. During this period he was employed by such important concerns as United Verde Copper Company, United Verde Extension Mining Company, and the St. Joseph Lead Company, acting as mine boss for some of them. Thus he obtained a practical knowledge of mine and geological problems in different localities. Such work, involving much time below ground, brought about a sinus condition that forced a change in occupation.

Joining International Paper Company in 1928 he made a complete survey of the company's coal properties in Newfoundland. Later on, he surveyed the company's potential oil properties in Alabama, Arkansas and Louisiana; also their cinnabar property in Arkansas.

Returning to headquarters in 1930 he made a study of various raw materials purchased by International. In 1934 he became New York office manager for International subsidiary, the International Paper Products Company.

In 1938 and 1939 he made his headquarters in St. Louis as district sales manager in charge of the sales of multi-wall shipping sacks. Moving to Allentown in 1939 he became district sales manager there covering a wide territory, and has been in Allentown ever since with headquarters at his home, 1330 Club avenue.

Garrett-Buchanan Co. Honored

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., February 26, 1945—In a radio program, February 7 over WCAU, entitled "A Salute to Uncle Sam's Industries," the Garrett-Buchanan Company was signally honored as distributors of printing papers, wrapping papers, envelopes, twine and cardboard of every description together with a large school supply department. In introducing Morgan T. Thomas, president of the company and E. J. Beale, vice-president, the announcer said: "This firm has been doing business since the 'gaslight era'; in fact it was awarded a gold medal for its wax products at the Centennial Exposition in 1876. Today, the Garrett-Buchanan Company has five large warehouses, located in different sections of the country, and a major portion of its work is supplying the Navy and Marine Corps with paper, cardboard and twine." Mr. Thomas, upon query from the announcer, stated that he is in his 46th year with the Garrett-Buchanan Company, having started as a youth, earning $10 a week, adding that he was very proud of the record of three of their employees—John, Merrill and Doyle Heverly, whose combined service record is 104 years. After paying glowing tribute to the employees of the company, who, he said are serving in the war effort by investing in War Bonds, contributing to the Red Cross Blood Bank, and to the Salvation Army, he turned the mike over to vice-president E. J. Beale who presented a detailed account of the company's work for our armed forces.

Thilmany Makes Good Safety Record

Since the last disabling accident, which occurred April 26, 1940, bag mill employees of the Thilmany Pulp and Paper Company, Kaukauna, Wis., have completed 1,001,424 man-hours of work with a perfect record.

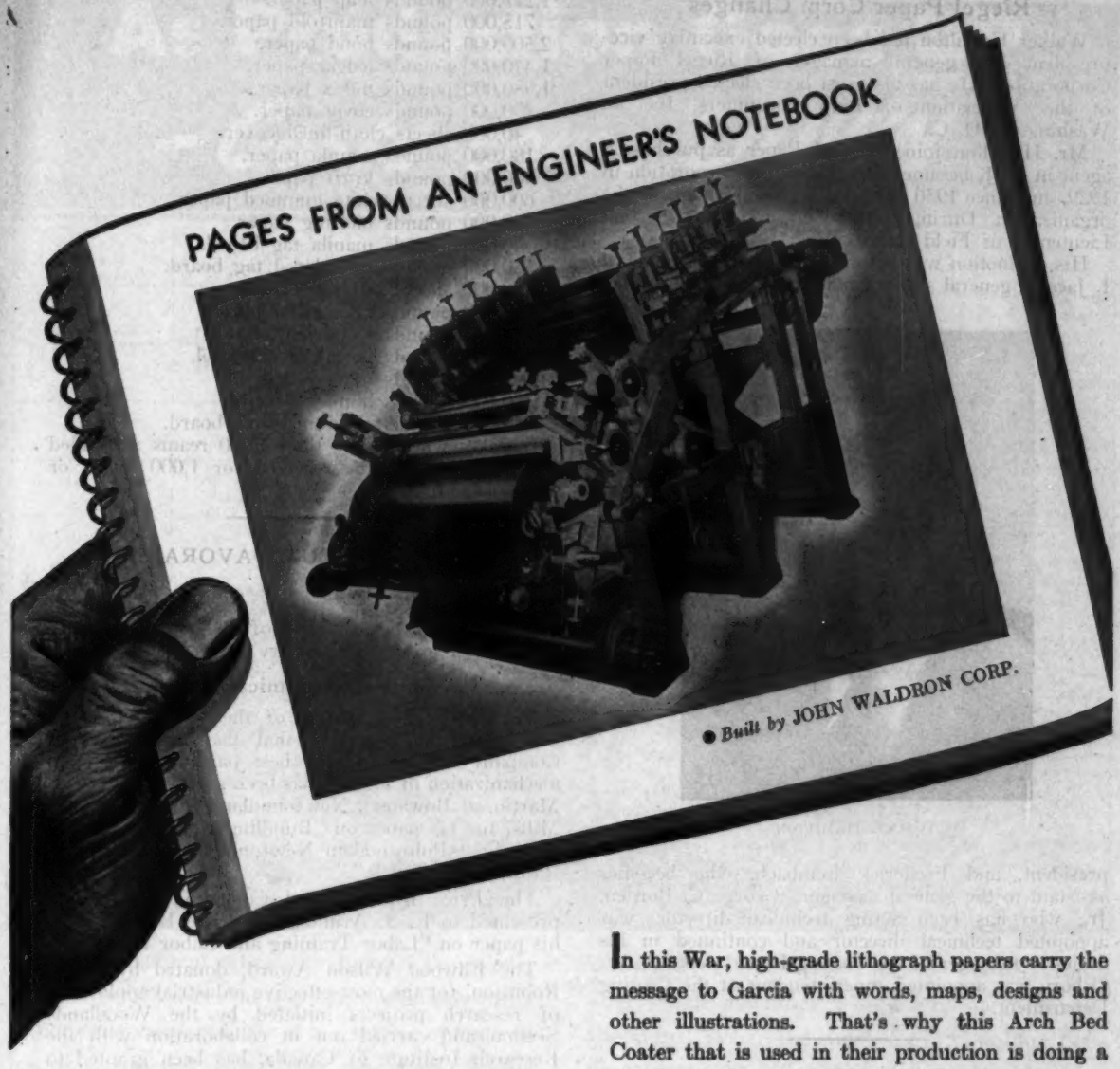
About 90 persons are employed, about 50 of them women. Since July 1, 1941, the bag mill has been entered as a separate unit in the National Safety Council contest and has won a first place award for three consecutive years. The no-accident record is still intact.

The bag mill operations present at least the average degree of mill hazards and the outstanding record is attributed to the cooperation of all members in the department. Joseph Scherer is superintendent and Don Cole is production and planning manager.

Prepares for Ice Breakups

The recent increased flow of the Wisconsin river has impelled the Wisconsin Valley Improvement Company, Wausau, Wis., to drain its reservoirs to 12 per cent of the available storage capacity, in order to prepare for any sudden breakup of the river ice.

The gradual draining of the reservoirs increased the river flow from an average 1,503 cubic feet per second at Merrill, Wis., for February 4, to an average of 1,741 feet for the week ending February 11, and materially benefited hydro-electric plants.



ANOTHER WAR JOB FOR SKF BEARINGS

In this War, high-grade lithograph papers carry the message to Garcia with words, maps, designs and other illustrations. That's why this Arch Bed Coater that is used in their production is doing a vital war job. And it's doing it efficiently, smoothly, and economically on SKF Bearings. Radial and thrust loads come and go, but they do not affect the easy running of SKF's. Low lubricant consumers, SKF's show hardly a trace of wear after years of dependable performance. On the machines that are winning the war—home front and fighting front—SKF always puts the right bearing in the right place. 5778

SKF INDUSTRIES, INC., PHILA. 34, PA.

Riegel Paper Corp. Changes

Walker Hamilton has been elected executive vice-president and general manager of Riegel Paper Corporation. He has also just been elected president of the Association of Pulp Consumers, Inc. in Washington, D. C.

Mr. Hamilton joined Riegel Paper as purchasing agent in 1921, became secretary of the corporation in 1929, and since 1936 has been a vice-president of the organization. During World I he served as a Second Lieutenant of Field Artillery.

His promotion was accompanied by those of Fred I. Jacoby, general superintendent, who is now a vice-president, and Frederick Leinbach, who becomes assistant to the general manager. George C. Borden, Jr., who has been acting technical director, was appointed technical director and continued in his duties as manager of the Coating Department. A. W. Osborn was appointed superintendent of the Coating Department.

WALKER HAMILTON

To Open Bids March 12

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 28, 1945—The Joint Committee on Printing will open bids for paper for use of the Government Printing Office for the three months period beginning April 1, on March 12. The meeting to make awards will be held on March 19. Bids will be asked for the following papers:—

1,500,000	pounds newsprint paper.
150,000	pounds telephone book news.
1,880,000	pounds machine-finished book paper.
3,500,000	pounds offset book paper.
110,000	pounds lightweight machine-finished book paper.
40,000	pounds 50% antique book paper.
1,300,000	pounds supercalendered book paper.
3,800,000	pounds machine-coated book paper.
400,000	pounds coated book.
3,200,000	pounds mimeograph paper.
500,000	pounds duplicator copy paper.
100,000	pounds U S M O safety writing paper.
13,950,000	pounds writing paper.
1,257,000	pounds map paper.
715,000	pounds manifold paper.
2,500,000	pounds bond paper.
1,440,000	pounds ledger paper.
1,980,000	pounds index paper.
290,000	pounds cover paper.
40,000	sheets cloth-lined cover.
180,000	pounds manila paper.
300,000	pounds kraft paper.
600,000	sheets white gummed paper.
40,000	pounds blotting paper.
40,000	pounds manila tag board.
530,000	pounds calendered tag board.
150,000	sheets railroad board.
200,000	pounds tan bristol board.
540,000	pounds wood bristol.
3,600,000	pounds postal card bristol.
500,000	pounds news board.
470,000	pounds blinder's board.
40,000	pounds chestnut cover board.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

PULPWOOD CUT FAVORABLE

(Continued from page 7)

mills, which have a capacity of 600,000 pounds per 24 hours of ground wood (dry).

Awards for Technical Papers

The Woodlands Section of the Pulp and Paper Association has reported that the Ontario Paper Company Award for the best paper last year on mechanization of logging has been given to Albert M. Martin, of Bowater's Newfoundland Pulp and Paper Mills, for his paper on "Bundling and Transporting Four Foot Pulpwood in Newfoundland by Steamer, Railway and Truck."

The Price Brothers and Company Award was presented to R. S. Armitage of Price Brothers, for his paper on "Labor Training and Labor Relations."

The Ellwood Wilson Award, donated by F. G. Robinson, for the most effective industrial application of research projects initiated by the Woodlands Section and carried out in collaboration with the Research Institute of Canada, has been granted to T. M. Pond, of Fraser Companies Limited.

No decision has yet been reached by the Award Committee regarding the J. A. Bothwell Award, offered by the Brompton Pulp and Paper Company in commemoration of the late J. A. Bothwell to a member of the Woodlands Section under 35 years of age whose achievement on behalf of forest conservation in Canada is recognized as the most meritorious.

Inner Workings of a Corporation

The "inner workings" of a corporation are featured in the current "Gallery of Ideas" which are a part and parcel of the selling program of the Swigart Paper Company, Chicago paper distributors. The Gallery now features exhibits of unusually effective house organs, booklets, brochures and annual reports which have been designed not only to inform but to develop better employer-employee relations throughout the companies whose work is exhibited. The entire arrangement is reported as designed to develop a better understanding between employer and employee.

As Production Goes UP
—Costs come DOWN

From the moment when the furnish flows over the fourdrinier wires the process of manufacturing paper consists essentially of a series of operations for removing the water from the fibers. At the wires this is done by suction; at the couch and felt, by pressure; at the drier rolls, by evaporation. Suction and pressure are fast and relatively inexpensive. Evaporation, slow and costly. Equip your paper machines with Hamilton Felts and speed up! When the sheets leave Hamilton Felts they contain so little water to be evaporated that less heat is needed at the driers. Formation is better, stronger, with corresponding reduction in broke. Production rises and costs come down.

« « From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost. » »

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending February 24, 1945

STOCKS

	High	Low	Last
A. P. W.	5¼	5⅜	5¼
Armstrong Cork Co.	47¾	46¾	46¾
Celotex Corp.	16⅞	16⅝	16½
Celotex Corp., pf.	19⅞	19¾	19¾
Certain-Teed Products Corp.	8½	8⅜	8½
Certain-Teed Products Corp., pf.	147¾	146	147½
Champion Paper & Fibre Co.	35⅞	34¾	34¾
Champion Paper & Fibre Co., pf.	115	114	114¼
Congoleum Nairn Co.	28½	28	28
Container Corp. of America	30	28⅞	28⅞
Continental-Diamond Fibre Co.	12¾	12	12⅜
Crown-Zellerbach Co.	22⅜	22	22
Crown-Zellerbach Co., pf.	104¾	104⅜	104½
Dixie Cup Co.	19¾	19½	19½
Dixie Cup Co.—A	49	48¾	49
Flintkote Co.	29¼	27¾	28
Flintkote Co., pf.	109½	109½	109½
Robert Gair	7	6¼	6½
Robert Gair, pf.	18¾	17¾	17¾
International Paper Co.	25⅛	22¾	24⅜
International Paper Co., pf.	92½	91½	91½
Johns-Manville Corp.	112⅜	110½	111¾
Johns-Manville Corp., pf.	...	...	...
Kimberly-Clark Corp.	45⅝	44½	45
Mac Andrews & Forbes	31¾	31¾	31¾
Mac Andrews & Forbes, pf.	...	...	...
Masonite Corp.	44¼	43¼	43½
Mead Corp.	14½	13⅝	14¾
Mead Corp., pf. A—6%	102½	100	100
Mead Corp., pf. B—5½%	97	96	96
National Container Corp.	14¼	13⅞	14¼
Paraffine Companies, Inc.	61	60	61
Paraffine Companies, Inc., pf.	...	...	...
Rayonier, Inc.	19⅞	18¾	18¾
Rayonier, Inc., pf.	36¾	35¾	36
Ruberoid Co.	37¾	37	37¾
Scott Paper Co.	43½	42½	43
Scott Paper Co., pf.	...	...	...
Sutherland Paper Co.	...	...	...
Union Bag & Paper Corp.	16⅜	15¾	16½
United Paperboard Co.	8	7½	7⅞
U. S. Gypsum Co.	86	85	86
U. S. Gypsum Co., pf.	184	184	184
West Virginia Pulp & Paper Co.	26¾	25¾	26¾
West Virginia Pulp & Paper Co., pf.	110	110	110

BONDS

Abitibi Pulp & Paper Co. 5s '53	105	103⅜	105
Celotex Corp. 3¾s '55	104⅛	104⅛	104⅛
Certain-Teed Products Corp. 5½s '48	103	102½	103
Champion Paper & Fibre Co. 4¾s '50	...	...	...
International Paper Co. 6s '55	109½	109	109⅛
International Paper Co. 5s '47	104¾	104¼	104¾
Mead Corp. 3½s '53	...	...	...
West Virginia Pulp & Paper Co. 3s '54	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending February 24, 1945

STOCKS

	High	Low	Last
Great Northern Paper Co.	38½	38	38½
Hummel-Ross Fibre Corp.	8½	8⅛	8⅛
St. Regis Paper Co.	7	6¾	6¾
St. Regis Paper Co., pf.	...	...	...
Taggart	7⅛	6¾	6⅞

BONDS

American Writing Paper Co. 6s '61	...	...	...

Fraser Companies Vote Dividend

Fraser Companies Limited, of Edmundston, N. B., have declared a dividend of 50 cents a share for the quarter ending March 31. Previous three payments were 35 cents a share, the latest declaration suggesting that the stock has been placed on an annual dividend basis of $2 a share, against $1.40 previously in effect.

Gaylord Corp. Votes Dividend

The Gaylord Container Corporation has declared a quarterly dividend of 25 cents, payable on March 15 to stockholders of record March 5. Previous payment was a quarterly of 12½ cents and an extra 12½ cents on December 15.

Howard Smith Votes Dividend

Howard Smith Paper Mills has declared an initial dividend of 25 cents a common share for the quarter ending March 31, payable April 30.

Donnacona Co. Issues Report

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 26, 1945—The annual report of Donnacona Paper Company for the year ended December 31, 1944, shows increased net profit after reduced interest charges and increased provision for income and excess profits taxes.

Net profit for the year was $273,725, equal to 72 cents per share compared with $194,846 or 51 cents per share in the previous year.

The directors' report, over the signature of Robert P. Kernan, president, states that the rate of depreciation has been fixed by the Department of National Revenue and as a result an amount of $562,938 has been deducted from the reserve for depreciation covering the years 1940 to 1942 inclusive. The depreciation for 1943 and 1944 was taken at the rate allowed by the Federal tax department. It adds that such additional income tax that will result from the disallowance of $562,938 in depreciation "has been amply covered" by a reserve for income taxes shown in the 1943 report.

The report adds that the standard profits of the company have not yet been determined.

Funded debt was reduced by $150,000 during the year due to retirement of first mortgage bonds. In addition, $400,000 ten-year notes were retired in August, the funds being obtained through a bank loan "on most favorable terms."

Robert Gair Plans Bond Issue

At the annual meeting of the Robert Gair Company to be held March 22, 1945, stockholders will be asked to approve an issue of $5,000,000 first mortgage and collateral trust sinking fund bonds, due 1961. Arrangements have been made for the immediate sale of $3,000,000 of these bonds to provide funds for the contemplated redemption on April 1, 1945, at 105 and interest, of the $3,350,300 6% income notes of the company due 1972. Arrangements have also been made for the sales of the remaining $2,000,000 bonds at any time within one year under certain conditions.

The directors have approved a plan of recapitalization under which, up to March 26, 1945, the holders of $2,272,150 income notes may exchange them for stock of the company on the basis of five shares of 6% preferred stock and five shares of common stock for each $100 par value of the notes.

Robert Gair Company, Inc. and subsidiaries report for the year ended December 31, 1944, combined net profit of $916,100 after provision of $2,005,298 for U. S. federal income and excess profits taxes, equal after preferred dividends to 61 cents per share of common stock.

For 1943, combined net profit was $1,064,486, after provision of $2,177,318 for federal taxes, equal after preferred dividends to 74 cents per share of common stock.

River Raisin Co. Nets 48 Cents

The River Raisin Paper Company for 1944 reports a net income of $220,044, or 48 cents a share, against $213,886 or 46 cents a share, for 1943; net sales, $8,275,912, against $7,578,463.

Oxford Co. Earns $1.03

The Oxford Paper Company for 1944 reports a net income of $899,195, or $1.03 a common share, against $838,988, or 87 cents a common share, for 1943.

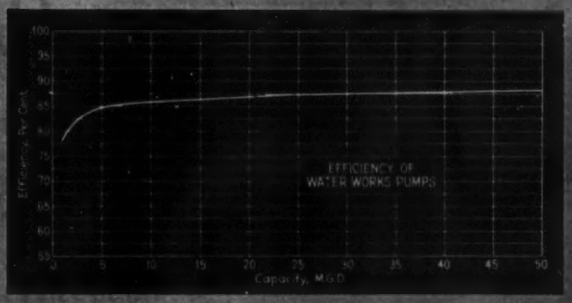
Sustained PUMP EFFICIENCY keeps power costs down!

IMPELLER WEARING RINGS—Threaded on impeller, not pinned or shrunk.
LABYRINTH CASE WEARING RINGS — Bronze, held in machined grooves in both case and cover, which prevents leakage.

Initial high pump efficiency is sometimes obtained by the use of excessively close clearances between wearing rings, but, attained in this way, it is not long maintained, particularly where flat rings are relied upon.

DE LAVAL LABYRINTH WEARING RINGS are distinct because, without resort to close clearances, they make possible high pump efficiency, which is maintained over a long interval, as demonstrated, for instance, by two 25 m. g. d. De Laval pumps in the Shawmont Station, Philadelphia.

Unit No. 4 in the acceptance test on January 22, 1927, showed a wire-to-water efficiency of 82.7 per cent and, when tested again on January 20, 1933, an efficiency of 83.9 per cent.



Efficiencies attainable with various capacities at heads between 125 and 225 ft.

Similarly, Unit No. 5 on the acceptance test on March 3, 1927 showed 83.3 per cent efficiency and, when tested again on January 31, 1933, it showed 83.9 per cent.

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For further particulars and other instances, ask for Publication P-3225.

DE LAVAL STEAM TURBINE CO. . . TRENTON, N. J.

Flintkote Co. Expands

The acquisition of new plant property, expanded facilities and an important source of raw material, located in the United States, Canada and Newfoundland was announced by The Flintkote Company of New York following the February meeting of its board of directors.

Acquisition of the Whippany, N. J. rubber reclaiming plant of Raybestos-Manhattan, previously operated by the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., transfers to the ownership of the Flintkote Company of New York, after approval of the New York Stock Exchange, the plant and a 55-acre property near Morristown, N. J. According to I. J. Harvey, Jr., president of the Flintkote Company, "the property provides greatly needed additional facilities in New Jersey for Flintkote, and will permit the relocation of certain operations from our main plant at East Rutherford, N. J." Furthermore, according to Mr. Harvey, the site offers "adequate space for development of other operations."

Mr. Harvey emphasized that the company's activities in the rubber and synthetic fields have accelerated rapidly during the past few years, and that the acquisition of the new facilities at Whippany permits further expansion in these markets.

"While the existing capacity of the former Raybestos-Manhattan Whippany plant, as well as the Flintkote plant now there, is fully occupied with essential war work, we shall undoubtedly require additional facilities in the near future to keep pace with our expanding business," Mr. Harvey said.

Simultaneously announced with the acquisition of the Whippany plant, was the purchase of the Tile-Tex Company, national manufacturers and distributors of the widely-accepted Tile-Tex floor coverings, pending approval of the Securities Exchange Commission and the New York Stock Exchange. This rounds out the expansion and diversification of the broad lines of Flintkote building materials and industrial products.

A mining property in Canada near Thetford Mines, Province of Quebec, has also been acquired by a newly organized subsidiary of the Flintkote Company Ltd., Canada, known as Flintkote Mines Ltd. Construction is under way on mining and milling facilities for the production of various grades of asbestos fiber. Ownership of this mine gives Flintkote an important source of raw material for its line of asbestos-cement roofing shingles, sidings and accessory products, it was stated.

It was also announced that the Flintkote Company (NFLD) Ltd., a subsidiary, has entered into an agreement with the Newfoundland Railway Company and the Newfoundland Government to supply requirements for creosoted ties and poles under a long term contract utilizing wood-impregnating plant facilities nearing completion at Clarendon, Newfoundland, and representing the only source of such supply in Newfoundland.

Mr. Harvey explained that the Flintkote Company was started nearly fifty years ago as a pioneer manufacturer of asphalt roofings. Since then, because of constant research, expansion and diversification together with wider distribution and greater acceptability of both building materials and industrial products, in the last decade, the company has grown so that today it owns and operates 18 plants and warehouses with 21 sales offices, serving every stategic market area in this country, Canada and Great Britain.

PAPER MILL OPERATORS!

Are you interested in—

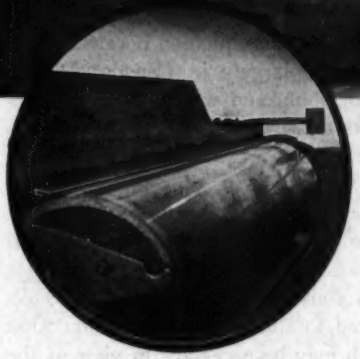
CONTROLLED PARTICLE SIZE AND SETTLING RATES FOR LIME, BY METHOD OF REBURNING AND SLAKING?

Write us making appointment to have a talk with our engineer.

TRAYLOR ENGINEERING & MANUFACTURING CO.

ALLENTOWN, PENNA., U. S. A.

LODDING DOCTORS



Old doctor back with new LODDING blade holder

Type M heavy duty for rubber covered rolls on high speed machines. Takes composition blades ¼" x 3". Can be moved out for additional wear

Type M showing blade moved out with new beveled edge for additional wear

THIS PRESS ROLL is equipped with LODDING DOCTOR and Standard Type K general purpose adapter.

LODDING FLOATING BLADE DOCTORS—light, sturdy, non-vibrating, non-sagging—give you the added protection of the LODDING patented streamline brass blade holder, eliminating buckling because the blade is permitted to expand under all operating conditions. The LODDING holder takes blade .015 to ⅛" thick—low operating angle, better fit, longer wear, no chattering. One full inch of blade wear. Complete change in less than one minute.

LODDING FLOATING BLADE DOCTORS clean safely any paper machine roll that requires doctoring.

Correct, continuous doctoring avoids much maintenance and operating trouble.

NEW MACHINE BUYERS ARE SPECIFYING LODDING DOCTORS AS ORIGINAL EQUIPMENT

LODDING ENGINEERING CORPORATION

WORCESTER, MASSACHUSETTS, U. S. A.

Represented outside of New England by

W. E. GREENE CORPORATION

Woolworth Building NEW YORK

PULP and PAPER MILL ACCESSORIES, Ltd., 2023 Aylmer Street, MONTREAL, QUEBEC

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger, Editor

COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

Empire State Section. Technical Association of the Pulp and Paper Industry—Second Thursday of each month at the Woodruff Hotel, Watertown, N. Y.

Chicago Professional Paper Group—Third Monday of each month except July and August at Chicago Bar Association, Chicago, Ill.

PAPER SUPPLY SITUATION

Paper supply for normal civilian uses appears unfavorable with critical shortages not far distant unless improvement occurs. There is no prospect at this date that any larger proportion of the over-all supply of paper will be allocated for the home front. The production of paper, in round figures, for 1944 was 17,183,000 tons, compared to 17,036,000 tons in 1943, and with 17,084,000 tons in 1942. The outlook for paper and paper board production, as reported by the Department of Commerce, for the first 1945 quarter is less favorable and is expected to decline below the last quarter of 1944. Some mills are operating at only 3½ days weekly and other mills have been temporarily shut down. The chief expectation of improvement is in more pulpwood for increasing the output of wood pulp, and larger collections of waste paper.

Military requirements for the first 1945 quarter, the Department's report goes on to state, not only equal the peak demand reached at the beginning of the third 1944 quarter, but are increasing. In January the Army increased its supply program for 1945 by about $1,500,000,000, which will be reflected in larger needs for packaging materials. Already an acute situation has developed in kraft paper and board for military uses. This, in face of smaller total supplies for all uses, will undoubtedly cause a further decrease in quantities available for civilian uses. The efforts being made to increase pulpwood cutting will not show any appreciable results as far as supplies of paper and board are concerned until the second quarter of this year. On January 16, 1945, the War Manpower Commission announced that the cutting of pulpwood and the production of wood pulp had been placed on the list of critical activities. Production of a number of types of paper, board, and converted products was placed on the list of essential activities.

In reference to the newsprint supply situation, the Department reports that in 1944 newsprint controls had been successively tightened by WPB in order to stretch the available supplies and avoid a further cut in consumption quotas. Newsprint consumption since January 1, 1944, has been maintained on the basis of a maximum 25% reduction under the amount consumed in 1941. This curtailment has been applied on a sliding scale in order to prevent undue hardship on smaller firms. The appeals procedure was standardized and the policy of WPB in regard to grants of extra newsprint on appeal was outlined in an amendment to Limitation Order L-240 in January, 1944. Available new supplies of newsprint for United States consumption of 273,000 tons per month are scheduled up to the end of 1945. This is the same average tonnage as supplied throughout 1944. The requirements of the armed forces and FEA for newsprint are increasing, and, until the shipping lanes in the Baltic and the Skagerrak are cleared, these demands will have to be filled from North American supplies. Many uncertain factors may develop within the next 30 days which may make it impossible to maintain present consumption quotas. Because newsprint supplies originate largely in Canada, relative problems of potential pulp and waste paper supplies are not the same as those facing domestic manufacturers of other grades of printing papers. Nevertheless, increasing war needs for pulp and pulpwood could conceivably cause some reduction in newsprint output both in the United States and Canada and eventually result in a reduction in scheduled supplies for United States consumption. The special Task Committee appointed to study changes in Limitation Order L-240, which may be necessary in view of the present critical pulp supply, has recommended that no further cuts be made in newsprint consumption during the second quarter of 1945. This recommendation was based on the fact that a diversion of groundwood pulp used in newsprint manufacture would give no material benefit or relief to consumers of high grade pulps and papers.

The supply situation in groundwood printing and book paper fields continues critical in the opinion of the Department, which states that a survey of magazine, book and commercial printing is being conducted by WPB to determine the paper inventory on hand at the end of January 1945. The survey when completed will show the number of tons of paper on hand, the number of calendar days these amounts represent, and the amount of printing paper consumed in 1944. Consumption of paper for the printing of books and magazines was tightened through amendments to Limitation Order L-244 for magazines, and L-245 for books and became effective February 5, 1945. Previous provisions of these orders required the publisher to certify to his paper supplier or printer that he was familiar with the order and that his order for paper was in compliance with its provisions. Under the new amendments an added responsibility is placed on the paper supplier and printer, since he is no longer protected by the certification of the publisher if he knows or has reason to believe that

the representations are false. Similarly, responsibility is placed on binders and distributors, wholesalers and dealers to exercise reasonable diligence in ascertaining that they are handling books or magazines published by legitimate users of paper within their legal rights.

To insure that Government needs for groundwood printing and book papers would be met, amendment to Conservation Order M-241, was issued on October 16, 1944, requiring mills producing these papers to hold 35% of their production subject to order of WPB until after the 15th of each month. This ruling is still in effect as the supply situation has shown no improvement.

Canadian Forestry Association Meets

At the annual meeting of the Canadian Forestry Association the year 1944 was stated to have been the most successful in the history of the Association. To focus popular interest on forest conservation new boards had been created in the three prairie provinces, with strong boards already existing in New Brunswick, British Columbia, Ontario and Nova Scotia. Traveling lecturers had taught forest fire protection in all the forest provinces, a traveling railway auditorium had aroused interest in shelter belt planting on the prairies, bodies of junior wardens were working in various provinces, and vigorous public service had been rendered by 12,000 boys organized as junior forest wardens under the Association's British Columbia branch.

Robson Black was reelected president for another year; Vernon E. Johnson, Montreal, was chosen as chairman of the board, and Dr. John S. Bates was reelected vice-president and chairman of the executive committee.

New directors chosen were: Major-Gen. Howard Kennedy, Thorold, Ont.; J. D. Brule, Val Brillant, Que.; W. A. E. Peplar, Quebec; Wallace Delahey, Toronto; Hon. J. L. Phelps, Regina, and W. F. Stewart, Vancouver.

"Paper—Weapon of War"

The war-time activities of D. L. Ward Company, Philadelphia, one of the country's leading distributors and converters of paper, are being forcefully brought to the attention of its employees and the public through a window display at the entrance to its offices in the Terminal Commerce Building.

The display is changed at regular intervals. The current one features a cluster of rocket launchers, with a roll of launcher paper and photographs of the Roysande Weather Recording Instrument Box; also a model paper-making machine—all through the courtesy of Hammermill Paper Company.

Also featured is a roll of ordnance (greaseproof and non-corrosive) paper developed by Paper and Corrugated Specialties Company—a Ward Division—which, in addition, is supplying special war packaging materials, detonator trays, foiling paper, airplane starter packers, teletype rolls, magazine discs, partitions and trays, parachute ribbon spools, and mimeograph paper for the war effort.

Still another Ward Division—Template Reproduction Company—is engaged in the production of tooling materials and tools through a new, fast, and accurate method, for a number of leading manufacturers throughout the country.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
Jan. 13	88.7	Jan. 15	89.5
Jan. 20	87.1	Jan. 22	86.1
Jan. 27	88.4	Jan. 29	89.1
Feb. 3	88.8	Feb. 5	88.4
Feb. 10	90.1	Feb. 12	88.8
Feb. 17	*91.0*	Feb. 19	89.2

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	90.1	92.5	90.6	82.4	88.1
1945	*86.7*												

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year to Date	65.1	77.9	88.2	87.0	104.1	87.6	88.7	*87.5*
Year Average	71.5	83.4	85.6	97.4	90.4	87.8	88.1	

*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1945		Corresponding Weeks—1944	
Jan. 13	95	Jan. 15	93
Jan. 20	94	Jan. 22	93
Jan. 27	95	Jan. 29	95
Feb. 3	92	Feb. 5	97
Feb. 10	93	Feb. 12	97
Feb. 17	*93*	Feb. 19	96

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	*91*												

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

Southern Paper Men Elect Officers

The Southern Paper Trade Association held its annual meeting at the Atlanta Athletic Club, Monday, February 12, 1945.

Officers were elected for the ensuing year as follows: president, W. A. Rhodes, S. P. Richards Company, Atlanta, Ga.; vice president (Fine) D. Page Sanders, Bond-Sanders Paper Company, Nashville, Tenn.; vice president (Wrapping) Mayer Myers Paper Company, Memphis, Tenn.; treasurer H. T. Newell, Jackson Paper Company, Jackson, Miss.; secretary, C. E. Dobson, 819 Carondelet Building, New Orleans, La.

Among other matters discussed was the possibility of increased local association activity on a city, or trading area basis. Entering in the discussion and taking notes for a report to their Southeastern Association were guests—Hugh C. Boyer of Caskie Paper Company, Charlotte, N. C., and Otto F. Hamilton of Hamilton Paper Company, Richmond.

Also present at the meeting were Harold Held of Javits & Javits, counsel for the National Paper Trade Association, and W. G. Leathers, both of whom led discussions on matters of current interest.

Paper Men Speak on Cost Components

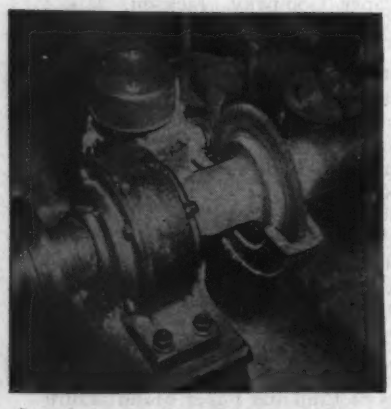
"Cost Components of Pulp and Paper Manufacture and Marketing" was the theme of the eleventh meeting of the pulp and paper class at Menasha High School, Menasha, Wis., Wednesday evening, February 14, sponsored by the school of vocational and adult education.

Fred Johnson, comptroller at the Marathon Corporation, discussed "Distribution of Actual Costs of Manufacturing," and "Standard Costs Procedures as Applied the Manufacturing Cost Control" was discussed by R. K. Neller of Kimberly-Clark Corporation. C. S. Marty, also of Kimberly-Clark, talked on "The Cost Component and Related Statistics as Applied to Marketing and Sales."

Modern round-chart Micromax Speed Recorder has big, bold dial—keeps a continuous 24-hour record. Can be calibrated in tons per hour, rpm, feet per minute, etc.

One of the 5 earlier Micromax models whose performance is reported below.

"With A Speed Recorder There Can Be No Arguments"



Rugged, water-tight tachometer (cover removed) is attached to machine's drive shaft.

Jrl. Ad. N-27-709(1)

"A nice thing about these Speed Recorders," says the chemist in a New England paper mill, "is that they show any fluctuations in speed due to poor regulation of the prime mover on the machine. Of course on a paper machine a variation in speed means a change in weight of paper. With a speed recorder there can be no arguments as to whether a speed variation occurred, how long it lasted, or how great it was.

"In our own mills, this information has resulted in improved governor drives on our two steam engines, a belt tightener on one of the engine driven machines, and a voltage control on one of the electrically driven machines. Of course, we might have made these changes without the speed recorders, but it would have been a great deal harder.

"Perhaps the best expression of the value of these instruments is the argument we used for installing them—what a saving of five minutes operating time per day on the machine would pay for the cost of installation in less than one year. This time saving is a very conservative estimate. It is brought about through more rapid adjustment of the machine to the proper speed when starting up or changing rate of speed, and an accurate knowledge at all times of the speed at which the machine is running.

"Of course, this is management's side, but I might say that the only squawk we get from the machine help is when electric power is off, and a recorder isn't running.

"We have one of these instruments on each of our five paper machines and have had them in use for nine or ten years. In this time we have had only a negligible amount of trouble—a good record, we feel, for equipment that runs continuously five to seven days a week with very little servicing."

We'll be glad to send you Catalog N-27, or have an L&N engineer help you with a specific problem.

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Edited by R. G. Macdonald, Secretary

The Operation of Rotary Lime Kiln in a Sulphate Mill*

By E. A. Harper[1]

Abstract

This paper presents the actual mill conditions in operating a rotary lime kiln in a sulphate mill. Consideration is given herein as to the method employed in operating and controlling a lime recovery system. The results are summarized and discussed as obtained in actual mill practice.

The purpose of this paper is to describe in some detail the operation of a rotary lime kiln. The general procedure of operation and controls on this lime recovery system may be applied to any mill using a rotary kiln for the recovery of lime from the causticizing process. The average results, tabulated in this paper, are from the operating and laboratory statistics. It covers a period of approximately 1 year of mill operation.

Description of Mill Equipment

The mill is equipped with one Allis-Chalmers rotary lime kiln-oil burner, (120 feet long, 7 feet in diameter), with a rated capacity of 35 tons per day. The chain section is approximately 21 feet, beginning back 4 feet from the feed end.

The kiln is lined with 6-inch bricks as follows from the discharge end back; 2 feet of H & W Crown, 5 feet of Anchor, 25 feet of Alusite, 5 feet Anchor, 58 feet of H & W Crown, and 25 feet of Wylam. On an average, the lining has been in service for a period of 1 year, with the exception of 12 feet in the middle section of the kiln, which is lined with H & W Crown, has been in service for 1.5 years.

In order to establish and maintain a uniform quality product at a maximum production rate, it is vitally important that this operation be equipped with proper controls such as fuel oil temperature control and temperature recorder, oil pressure regulator valve, fuel oil flow meter, induced damper control (motor operated), induced and forced draft indicators, flue gas temperature recorder, lime temperature recorder, mud sheet thickener indicator, and kiln speed regulator.

Operation

The purpose of a lime recovery system is to convert the calcium carbonate sludge formed in the causticizing process to active calcium oxide as economically as possible from the standpoints of raw material and operating cost.

The lime sludge from the cauticizing process, after it has been washed in a Dorr Clarifier, is pumped to a vacuum filter for further washing and thickening, from here it is fed into the kiln by means of a screw conveyor.

In the operation of a lime kiln, it is important to remember that there are two distinct processes taking place: (1) the mud is dried and (2) the dry mud is calcined. In view of these two distinct and separate operations which must be carried on simultaneously, the operator must always bear in mind that both ends of the lime recovery system must receive his attention.

With everything operating uniformly and without any change in feed rate the lime should always be of good quality and there will be no necessity for changing the fuel or air flow rates once they are properly established.

In our installation, in order to obtain the most satisfactory kiln operation from the standpoints of quality and quantity of lime, it is believed that it is necessary to maintain the following condition:

1. The chain section temperature of approximately 450° F. and a lime temperature between 2000 to 2200° F.

2. The mud feed rate to the kiln should be held as constant as possible, with a consistency of approximately 55.0% (moisture-free basis).

3. The kiln speed (r.p.m.) should be controlled by the amount of lime produced. For our kiln, the following relationship between kiln capacity and kiln speed is suggested:

Kiln Capacity Tons/day	Kiln Speed R.p.m.
0.30	0.45
31-40	0.60
41-50	0.90
51-60	1.20

TABLE I—AVERAGE OPERATING RESULTS

Forced draft	—0.05 to +0.03
Induced draft, inches H_2O	5
Damper opening, %	67
Chain temperature, °F.	475
Lime temperature, °F.	2055
Oil temperature, °F.	235
Gallons oil per ton lime	75
B.t.u. per ton of lime	11,250,000
Oil lime pressure, lb. gage	78
Moisture in filter cake, %	45.0
Filter, cake thickness, inch	0.75
Tons lime per hour	2.43
Calcium oxide content, %	88.1
Slaking time, minutes	2.667
Settling rate, 50%	1-55
Soda as Na_2O, %	1.23
Free lime in sludge (moisture-free), %	3.31

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

[1] Member TAPPI; Tech. Director, Brunswick Pulp and Paper Co., Brunswick, Ga.

Discussion

One of the principal problems confronting the lime recovery operation is the formation of rings in the kiln. As is known, a ring is a doughnut like formation somewhere near the midsection of the kiln formed by adhering of lime to the walls of the kiln at that point. As operation proceeds, the ring either falls out or builds up to such an extent that production is impaired. The tendency for ring formation in a lime kiln appears to be a function of the ratio of surface to mass, which ratio is, of course, a function of particle size. In other words, the larger the particle size at the point of the ringing zone less will be the tendency for ring formation.

The wet sludge, as it dries out, forms two things, dust and pellets. The pellet size will not adhere to the walls of the kiln, while on the other hand, dust will invariably do so if in proper contact of the wall at the proper temperature.

The calcium carbonate sludge fed to a lime kiln contains varying amounts of alkali. The amount of alkali may be varied widely by varying the degree of washing. For satisfactory operation, it is believed that the soda content in the sludge should be as low as possible, not over 1.0% as Na_2O. Lime sludge, with a high soda content is poor practice as this has tendency to both form rings and leach out the kiln lining.

Free lime in the sludge seems to influence the ringing characteristics. In general, it is safe to say that free lime, even in small amounts, will help to increase the proportion of pellets formed, which fact is indicated by a slight reduction in dust carry-over, as shown by the amounts of dust collected in the stack dust chambers. It must be remembered, however, that carrying an excess of free lime in the sludge increases the oil consumption and reduces efficiency.

Recommendations

1. The lime sludge to the kiln should be washed as free of soda as possible.
2. The consistency of the sludge to kiln should be kept between 50 and 55.0% (moisture-free basis).
3. The free lime in the sludge should be maintained between 3.0 to 5.0%.
4. A constant rate of feed to the kiln should be maintained. This to be established by the speed of the kiln.
5. Keep the chain section temperature not over 525° and not under 400° F.
6. To maintain the lime temperature between 2000 to 2200° F.

A New Apparatus for Determining the Water Vapor Permeability of Sheet Materials

By Ralph T. K. Cornwell[1]

Abstract

A humidity cabinet is described wherein samples may be tested for water vapor permeability without being removed for weighings. Arrangements are provided for altering the test conditions as desired. The test specimens are prepared in accordance with TAPPI Standards and the transmission curve can be determined within a few hours.

Since 1909 more than 150 articles have been published which deal in some way with the water vapor permeability of films or sheet materials. Because of the great importance of this subject in relation to the protection of food stuffs and other materials for the armed forces, it has been the subject of many recent discussions. Hence, no attempt will be made here to review the literature and references will be given only to TAPPI Standard T464m-44.

The methods in general use involve sealing the film over a test cup which contains either a desiccant or water (an aqueous solution of salt may be used). After weighing, the test cup is placed in a cabinet where it is subjected at a definite temperature to either a definite high relative humidity or a dry atmosphere for 24 hours or longer. The cup is then reweighed after conditioning near the balance and from the gain or from the loss in weight, the area of film exposed, and the time, one computes the water vapor permeability. This is expressed as grams per square meter per 24 hours, at $T°$ and $x\%$ relative humidity versus $y\%$ relative humidity.

The test is usually repeated until either check results are obtained or a straight line results when time against change in weight is plotted.

Several days at least are required for the completion of this test. Since it is very desirable to know something about the behavior of the film when subjected to different conditions, several weeks may be necessary for the completion of the investigation.

Most of the investigations have involved (1) the construction of a constant temperature-constant humidity cabinet, (2) the design of the test cup and method of sealing the film, (3) procedures and experimental difficulties.

Considerable time is lost and experimental technique made more exacting when the test cup has to be removed from the test cabinet for weighing. It seemed desirable, therefore, to develop an apparatus in which the test cups could be weighed inside the cabinet without interrupting the test. The cabinet should also be arranged so that the test can be carried out under a variety of conditions. While for the purposes of checking results a standard test is most desirable, the scientist investigating new films must carry out this test at different temperatures and humidity gradients.

The Brabender moisture tester seemed a peculiarly appropriate apparatus to start with since it combines a constant temperature cabinet and balance in such a way that test cups can be weighed without removing them from the oven. With certain modifications this has been converted into an instrument which has

[1] Member TAPPI; Director of Research, Sylvania Industrial Corp., Fredericksburg, Va.

The apparatus described may be purchased from the Brabender Corporation, Rochelle Park, N. J. For convenience, it is called the Cornwell WVP Tester.

been successfully used for over a year for determining the water vapor permeabilities of films under a variety of conditions.

Operation of Apparatus

This new apparatus consists of a constant temperature cabinet through which air is circulated. The air in-take and outlet are at one side and can easily be attached to a closed container holding the proper reagents to give a definite relative humidity, e.g., the air can be passed through a powerful desiccant or bubbled through water so that a relative humidity from about 0 up to about 100% can be maintained in the cabinet. Instruments can be inserted in the line near the outlet to measure the relative humidity of the air leaving the cabinet and also to measure its velocity. If desired, one could attach a Lectrodryer and always maintain a relative humidity near zero. However, it seemed better to arrange the new apparatus in such a manner that the investigator can have a constant temperature-constant humidity cabinet in which the conditions can be easily varied.

The cabinet has space for ten test cups at one time. The numbered cups which are provided conform in general to the TAPPI specifications and are assembled according to the TAPPI directions. (This is an excellent apparatus in which to carry out the standard TAPPI test.) The cups are placed directly in the cabinet without previously weighing them. It is never necessary to get the actual weight of the test cup. After the cups have been in the oven for 5 or 10 minutes they are suspended on the balance one at a time and the scale reading recorded. Maintaining the same order, the weighings are repeated after about 0.5 hour and from then on perhaps every hour until check results are obtained. The test can be carried on as long as practical although sufficient data can be obtained in a few hours to plot a straight line from which the computations can be made. The permeabilities obtained in this instrument agree very closely with those obtained under the same conditions by more cumbersome and lengthy techniques.

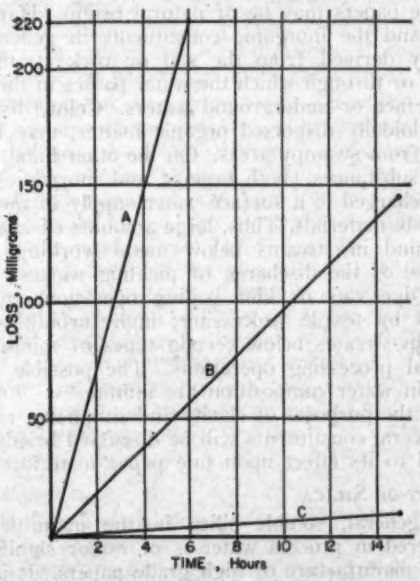

FIG. 1

A—Regenerated Cellulose Film 0.0012 inch thick (no softener). B—Regenerated Cellulose Film A Coated with Composition Comprising Nitrocellulose, Ester Gum, and Dibutyl Phthalate. C—Regenerated Cellulose Film A Coated with Composition Comprising Nitrocellulose, Ester Gum, Dibutyl Phthalate and Paraffin Wax (Coatings on both sides of the cellulose film, 0.0001 inch. Area of film = 4.9 sq. in.)

Figure 1 shows how quickly results can be obtained. In these tests, 15 ml. of water was placed in the cup and the air circulated through calcium chloride. The temperature was maintained at 45°C. (113°F.). The oven was heated to the proper temperature before placing the test cups inside. The first reading was made about 20 minutes later which time was allowed for establishing equilibrium. The time required for reaching a definite rate change will depend upon the film, the temperature, and the humidity gradient. The area of film exposed is always the same.

The scale of the balance of this instrument reads in per cent rather than in grams and a chart is provided for transposition. However, one soon remembers that a per cent is equal to a certain number of grams and can easily compute the per cent gain or loss into milligrams gain or loss. (A scale reading in grams will be provided at considerable extra cost.) The only care required is in adjusting the balance so that the initial reading is made at the correct end of the scale. This will depend upon whether a loss or gain in weight is involved. Directions are supplied for operating and adjusting the balance.

In this new apparatus the moisture vapor permeabilities of films and sheet materials can be conveniently studied under a great variety of conditions. One can place the instrument in a cold room for low temperature investigations. The films may be creased before sealing over the cup. If the film or composition is not self-supporting, it can be cast or coated on a sheet of regenerated cellulose which is free from softener or plasticizer.

Furthermore, it is also possible to make small packages simulating actual use of the material. These test packages are placed in the oven and it is comparatively easy to determine the protection offered by the material under a variety of atmospheric conditions.

Not only is this new apparatus satisfactory for investigating permeabilities of films by the user but it has also, because of quick results, proven itself useful for plant control work by the manufacturer. With a very little experience one can obtain results of value in controlling the manufacturing process within an hour. Data illustrating the use of this new instrument will be published later.

Acknowledgement

Credit is given to Miss Elizabeth Carmichael and W. B. Kunz for their assistance in the experimental work.

Revamping Wips at Neenah

Revamping of the Women in Production Service organization at Kimberly-Clark's Lakeview mill at Neenah, Wis., is under way in preparation for presentation of the new program for all feminine employees by March 1.

Ranks will be eliminated with exception of those of major and one-star major which involve one and two year adherence to the qualifications of no absences for one or two years, 10 per cent payroll deductions for war bonds, one or two year record of no injuries, one suggestion adopted, some form of patriotic activity and efficient job effort.

Rules and regulations governing the reorganized Wips are being drafted and will be distributed by the coordinator. The central control committee will continue to set up policies, act on suggestions and amend standing rules if necessary.

Process Water for Fine Paper Manufacture*

By Lewis B. Miller[1]

Abstract

The quality requirements for process water for the manufacture of fine papers is outlined in the present paper. The work of the TAPPI Water Committee, from whose investigations the present ideas upon this subject have been drawn, is briefly reviewed. Through the use of a hypothetical water, (which, however, approaches in composition certain natural waters) some of the complexities which may arise in selecting a suitable treatment system to fit the raw water for process use, is demonstrated.

Every manufacturer of fine paper must have available a water supply of ample quantity and proper quality. Where the quantity at first approach appears inadequate, a careful study will often provide means of conserving process water within the mill sufficiently to permit satisfactory mill operation with the supply available *(7)*. Where the water available is of inferior quality for the particular types of paper which it is proposed to manufacture, modern means for treating the water can be readily provided which will improve most raw waters to the extent required for the usage in question.

For the past half dozen years the TAPPI Water Committee has been investigating the general subject of the quality of process water required for the manufacture of paper. The Committee began this project with the idea that information upon process water quality for the manufacture of the numerous grades and types of paper could be assembled simultaneously and the entire field surveyed in a brief period of time. It very soon became apparent that accurate information on this subject was almost completely lacking. The subject was, therefore broken down into several subdivisions based upon paper quality. An intensive investigation was made first upon the quality of process water required for the manufacture of high grade or fine papers, including bond, ledger, book, and writing papers.

It was felt that this was the logical starting point since fine papers demand a better quality of process water for their manufacture than do intermediate grade or coarse papers, and more information should therefore be available regarding water requirements for the higher grade papers. Paper manufacturers were most cooperative in furnishing any information at their disposal but the dearth of accurate information was obvious. The information obtainable was usually fragmentary, often contradictory, so that several years of continuous effort were required to provide sufficient accurate data upon which the committee could base recommendations to the paper industry regarding water requirements for the manufacture of this group of papers.** The information accumulated during the course of this investigation has been published from time to time *(1, 2, 3,* and *4)* and has finally been concluded by the preparation of a Tentative TAPPI Standard or specification containing the recommendations of the Water Committee for the quality of water to be used in the manufacture of fine papers *(5)*.

It may be added parenthetically that this investigation is now being extended to water quality requirements for the manufacture of other grades of paper. Following the completion of this work in the field of paper manufacture, it is planned to extend these studies to the field of pulp preparation.

Constituents of Process Water Important in the Manufacture of Fine Papers

Following is a list of those common constituents of water which have been found of importance as affecting the manufacturing operations or the product quality of fine papers:

1. color; 2. turbidity; 3. total hardness; 4. calcium hardness; 5. alkalinity; 6. iron; 7. manganese; 8. silica; 9. residual chlorine; 10. total dissolved solids; 11. free carbon dioxide; 12. pH; 13. organic materials; and 14. biological growths.

The water constituents included in this list are limited to those which are common to most surface and well waters. Other constituents of water under special circumstances may also be of importance, such as heavy metals, toxic substances, or in the case of heavily polluted waters, substances such as sulphides or other highly reactive chemical materials.

The constituents of water which in limited amounts are found to be disadvantageous in the manufacture of fine papers may be of natural origin. Hardness, iron, and the inorganic constituents in general are usually derived from the soil or rock strata over which or through which the water passes in the form of surface or underground waters. Color, dissolved or colloidally dispersed organic matter, may be derived from swampy areas. On the other hand, all of these substances (both organic and inorganic) may be discharged to a surface water supply in the form of waste materials. Thus, large amounts of iron may be found in streams below metal working plants because of the discharge of pickling wastes; colors from dye vats or kier boiling operations may be caused by textile processing; high turbidities may exist in streams below certain types of mining and mineral processing operations. The possible variations in water composition are infinite.

For the purposes of clarity and simplicity, each of the several constituents will be discussed briefly with regard to its effect upon fine paper manufacture.

Effect of Silica

In general, soluble silica in the quantities encountered in process water is of minor significance in the manufacture of high grade papers. It is well known that soluble silica, if present in sufficient concentrations, will impart a quality designated as "tinniness" to paper, and sodium silicates are sometimes added to the paper furnish for this purpose. It seems

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** The TAPPI Water Committee has the following membership:
Lewis B. Miller, chairman
C. M. Connor, Glassine Paper Company
Miss L. E. McGrath, Booth Chemical Company
R. B. Martin, Wallace and Tiernan Company
W. F. Mitchell, Pennsylvania Salt Manufacturing Company
J. G. Patrick, West Virginia Pulp and Paper Company
E. N. Poor, American Cyanamid Company

The Water Committee has also received extensive assistance in the course of these investigations from R. G. Macdonald, Secretary of TAPPI, Richard T. Bingham, assistant to the secretary, and Vincent F. Waters, formerly assistant to the secretary, and now Editor, *Southern Pulp and Paper Journal.*

doubtful that the concentrations of soluble silica to be found in most process waters would be sufficient to have a pronounced effect in this respect.

In this connection, it is probable that silica in the form of soluble sodium silicate, in which condition the silica is present at least to some extent in the form of a more or less complex silicate ion after dilution in the process water, is the effective constituent in imparting tinniness to paper. There is some evidence to support the idea that silica in the form of sodium silicate would be present in natural waters only at pH values well above 8.0. Since most natural waters possess pH values below 8.0, it is probable that the silica is present not as soluble sodium silicate or silicate ion, but rather as colloidally dispersed, very slightly ionized complex silicic acid molecules. In this condition the silica would probably have comparatively little effect upon the properties of paper. It would be in a condition, however, in which adsorption by a solid phase of opposite charge would be readily effected and it is well known that silica even in limited amounts in process waters is deleterious to pulps washed with such waters. Under these conditions the silica appears to coagulate or adsorb on the surface of the pulp, and cannot be washed out. In fact the longer the washing is continued (with additional fresh water) the more silica is adsorbed, and the worse the results obtained in the increased ash content of the pulp.

Effect of Iron and Manganese

From the standpoint of the manufacture of fine papers, iron and manganese are two of the most undesirable constituents of process water. They are considered together since they behave similarly and since they exert deleterious effects even in minute concentrations. The presence of either or both in process water causes staining and a loss in brightness in the resultant paper. Concentrations in excess of 0.1 p.p.m. of iron expressed as Fe or of 0.05 p.p.m. manganese expressed as Mn cannot be tolerated in the water used for most fine paper manufacture. For special papers such as light sensitive papers (blue print, photographic papers, etc.) it may be necessary to reduce the concentrations of iron and manganese even below the limits indicated.

These elements are even worse offenders when present in the water used for pulp washing since they tend to adsorb on the pulp and cannot be washed out. As in the case with silica the longer the washing is continued, the more iron or manganese will be adsorbed, and the more discoloration will result in the washed pulp *(6)*.

Iron and manganese are also essential to the life processes of certain types of microbiological growths known as *Crenothrix*. These growths develop in pipes and closed spaces through which the water passes in forms simulating iron rust and in which the iron and manganese are present within the growth. From time to time portions of the growth breaks loose to pass onto the paper, thus forming discolorations and stains.

Effect of Color

As indicated in an earlier paragraph, color may be caused by natural water ingredients such as the organic matter present in swamp waters, or to industrial wastes such as dyes, or to colors derived from the manufacture of certain explosives, etc. Most of such colored substances affect the brightness and color of bleached pulp or paper products. Some types of color are, of course, more undesirable than others and some are much more difficult to remove from process waters than others. In general process water for fine paper manufacture should not contain color in excess of 5 platinum units.

Effect of Turbidity

Inorganic or organic constituents present in process water in the form of turbidity may affect the color and brightness of paper. Undoubtedly the specific nature of the turbidity, as well as the particular paper quality being manufactured, determines the permissible upper limit of turbidity for use in a given process water.

In this connection it should be emphasized that foreign coarse suspended matter in process water usually cannot be tolerated. Water containing such suspended matter may show a low "turbidity" when measured by any of the usual standard methods but would be apparent from visual observation or from a determination of "suspended solids" by filtration and weighing of the filtered residue.

Effect of Hardness

Hardness may possess several variations. In general, waters are said to be hard when they contain appreciable quantities of calcium or magnesium salts. Hardness may be of the carbonate variety in which the calcium and magnesium are present as carbonates or bicarbonates, or of the noncarbonate variety when present in the form of salts other than carbonate, such as sulphate, chloride, nitrate, etc.

Certain types of sizing, such as rosin size, react with soluble calcium and magnesium salts to form insoluble soaps in much the same way that they react with alum to form the insoluble aluminum resinate soap which is formed when rosin size is "set" with alum. Unfortunately the calcium and magnesium soaps are not of the same desirable character as regards sizing effect as is the alum soap.*** In fact, the calcium and magnesium soaps are sticky products of practically no sizing effect which adhere to some extent to the paper stock causing variations in the sizing on the paper. The consequence is that that portion of the size which reacts with the hardness in the water is lost and increased quantities of size must be used to arrive at the desired results in the sized paper. Thus, increase in size usage occurs, resulting in an increased manufacturing cost, and frequently in a nonuniform sizing effect on the paper itself. In this connection both calcium and magnesium hardness are undesirable since both elements behave similarly with sizing.

Calcium and magnesium hardness, whether present in the carbonate or noncarbonate forms, react with sizing as indicated above. However, hardness of the carbonate variety may have additional undesirable effects. Both the bicarbonate and carbonate of magnesium are comparatively soluble. The bicarbonate of calcium is also fairly soluble, but the normal carbonate is very insoluble. If an appreciable hardness because of calcium bicarbonate is present in process water, and if an increase in the pH of the water occurs due to a release of CO_2 caused by a temperature increase or an aeration effect, a precipitation of insoluble calcium carbonate may occur. Such precipitation frequently occurs as a scale. Loss of CO_2 from the water occurs most easily and rapidly where the water is exposed to the air; such a condition

*** There is some evidence available to indicate that a limited amount of hardness may be advantageous to sizing in the case of certain types of sizes. Insufficient evidence is available to the writer to generalize on this phase of the subject.

exists where the sheet is formed on the wire. Carbonate scale formed at this point is a common occurrence. This reduces the ease of formation of the sheet and eventually, because of plugging of the screen openings, the wire must be cleaned with acid, resulting in outage of the machine.

Effect of Alkalinity

Alkalinity in water is usually due to carbonates and bicarbonates of calcium, magnesium, or the alkali metals. It is thus related to hardness. These carbonates and bicarbonates may have undesirable effects. Where sizing is used, additional alum must be added to destroy most of the alkalinity before the sizing approaches its optimum efficiency. The addition of alum or other acidic substances in their reaction with alkalinity tends to release carbon dioxide gas. As indicated above, carbon dioxide may escape from the paper stock at any time but is particularly apt to do so on the wire, resulting at times in blisters and pin-holes in the finished sheet.

Effect of Total Dissolved Solids

Total dissolved solids include those dissolved substances which have been discussed in detail in previous paragraphs. Under this heading are also included such compounds as the salts of the alkali metals, sodium, potassium, and ammonium, and soluble chlorides, sulphates, nitrates. Most of these have little effect upon paper manufacture. Chlorides, if present in appreciable quantities, increase the corrosiveness of water. Ammonia affects the bacteriacidal effect of chlorine when added to the water, but this is a special condition. It is desirable, however, to limit the concentration of total solids in process water within reasonable limits, even if the electrolytes present are of a comparatively nondeleterious type.

Stability of Water

Water in a condition of stability may be defined as that condition where neither corrosion nor scale formation will occur. This condition is dependent upon the concentration of total dissolved solids, calcium ion, alkalinity, and the temperature and pH of the water. The condition of stability may be determined approximately by means of the Langelier equation. The further the water departs from the condition of stability, the greater will be the tendency of the water to cause corrosion or to form scale, depending upon the direction of departure from the condition of stability. Conversely waters which are strongly corrosive or scale forming may be adjusted chemically to a condition approaching stability. It need not be remarked that waters which are either markedly corrosive or scale forming are undesirable to that extent for paper manufacturing purposes.

Combinations of Constituents

It should be pointed out that combinations of radicals or elements may behave quite differently than the individual radicals or elements considered by themselves. This is exemplified in the case of calcium, which behaves quite differently if present as calcium chloride or sulphate, than if present as the bicarbonate. Similarly magnesium and silica tend to form scale particularly at elevated temperatures. Chlorine behaves differently in the absence and presence of ammonia. These will serve to illustrate the principle. Obviously it requires a technical man thoroughly familiar with water chemistry to diagnose all the possible ills that may arise from the use of a particular water.

Water Treatment

Just as a disease must be first diagnosed and then treated in order to effect a cure; so must a given raw water be studied to diagnose its suitability, or lack of suitability, for use as process water in fine paper manufacture and an appropriate treatment prescribed to improve its condition. Unfortunately, it is not quite as simple as that. A given source of water usually functions not as process water only, but also for boiler feed, cooling, and drinking purposes. A water composition that might be eminently satisfactory for process purposes, might be quite unsuited for one or more of the other purposes indicated. The prescribed treatment for the water should then be such as to render it most suitable for all purposes in the over-all picture, with compromise made where it will be least harmful. In case of an absolute incompatability, or where certain of the usages are small, the economic and technical solution may require usage of water from more than one source, or an added treatment for the water used for certain purposes. This would be a case for diagnosis and treatment by the specialist rather than by the country practitioner.

Use of Poor Water A Handicap

In the earlier paragraphs of this article the deleterious effects of various process water constituents upon the quality of the final paper product have been discussed in some detail. Where the paper manufacturer, who uses a process water of undesirable characteristics, recognizes the condition the situation is not hopeless, for when the manufacturer finds the use of the water too great a handicap to proper operation, steps will be taken to provide a better quality water. Unfortunately many paper manufacturers fail to recognize the handicap which they impose upon themselves through the use of poor quality process waters. This fact was reflected again and again in the replies to the questionnaires received by the TAPPI Water Committee in their investigation of this subject, e.g., a number of manufacturers reported the use of waters high in iron and manganese in the production of fine papers. It is true that the effect of such waters can be counterbalanced to some extent by the use of higher quality fibers, pigments, and other raw materials but this is the expensive way to achieve proper quality in the finished product. With the knowledge now available regarding the quality of water required as process water and how to obtain it, and with the excellent and efficient equipment available for obtaining it, the paper manufacturer need no longer handicap himself through the use of process water of poor quality.

In this connection and at the risk of being found repetitious, it may be worth while to present once more the upper limits of the common elements found in process water to be used in the manufacture of fine paper, as set forth in TAPPI Tentative Standard E 600 s-44.

It must be clearly understood that these values are to be used only as a guide; in many cases the maxi-

TABLE I.—RECOMMENDED WATER QUALITY FOR FINE PAPER MANUFACTURE

Substance	Maximum p.p.m.
Turbidity as SiO_2	10
Color in platinum units	5
Total hardness as $CaCO_3$	100
Calcium hardness as $CaCO_3$	50
Alkalinity to methyl orange as $CaCO_3$	75
Iron as Fe	0.1
Manganese as Mn	0.05
Residual chlorine as Cl_2	2.0
Silica (soluble) as SiO_2	20
Total dissolved solids	200
Free carbon dioxide as CO_2	10

mum values for some of these water constituents, for the manufacture of certain fine papers, will be considerably lower than those indicated.

Most Suitable Water Treatment

Unfortunately in selecting a water for paper manufacture or in considering treatment for an available water supply to fit it for this purpose, the picture is by no means as simple as has been indicated. In most cases the water supply to be used for process purposes must also serve as a boiler feed water, as potable water supply and possibly for cooling purposes and for pulp washing in addition. A water quality suitable for one or more of these purposes may be unsuitable for the remainder. In order to make the point more clear, take a water of known composition and consider it in this light:

TABLE II.—ANALYSIS OF A HYPOTHETICAL RAW WATER

	p.p.m.
Turbidity as SiO_2	25
Color in platinum units	30
Total hardness as $CaCO_3$	282
Calcium hardness as $CaCO_3$	238
Magnesium hardness as $CaCO_3$	44
Alkalinity to methyl orange as $CaCO_3$	276
Chlorides as Cl	29
Sulphates as SO_4	107
Iron as Fe	2.4
Manganese as Mn	trace
pH value	7.4
Free carbon dioxide as CO_2	9.0
Silica (soluble) as SiO_2	7.0
Fluoride as F	0.9

This water is too high in turbidity, color, hardness, alkalinity, and iron to be used as process water for fine paper manufacture.

Assuming that the boiler plant is to operate at 250 p.s.i. pressure, it is clear that the water is too high in hardness and alkalinity for this purpose, and the amount of iron and turbidity present is undesirable.

As drinking water, this water is too high in turbidity, color, and iron to pass the Public Health Service Drinking Water Standards. In fluoride content it barely passes these standards and users of this water would do well to analyze the water periodically to insure its remaining within proper limits of fluoride content.

The water is definitely scale forming and would tend to deposit scale even in a once-through cooling system. In a system utilizing recirculation the scale forming tendencies would be increased.

For pulp washing purposes the water is too high in iron content *(6)*, as well as in turbidity and color, and possibly in certain other constituents also.

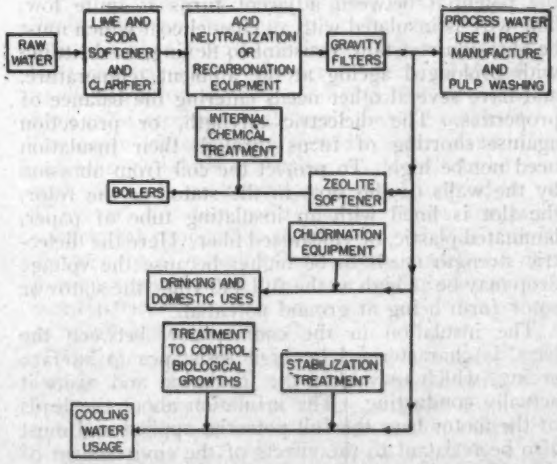

FIG. 1

Treatment System for a Hypothetical Water to Fit It for Use in Fine Paper Manufacture

The problem is, then, to select the most suitable treatment to fit this water for all of the required purposes and to make this selection the most economical method of treatment, both with regard to initial investment for equipment and with regard to cost of chemical treatment, labor cost for operating, and maintenance cost. Local conditions will have a bearing upon all of these factors, e.g., a small manufacturer with little or no technical staff, and located where the competition for labor is keen, will want a system as nearly automatic, foolproof, and free from maintenance troubles as possible. A manufacturer with a strong engineering staff and at least a reasonable supply of labor may be able to avoid some of the initial costs with regard to automatic equipment, which would be a real economy in the case of the smaller manufacturer, cited above. A water requirement which fluctuated rapidly and over a wide range would require equipment of a more complete and automatically adjustable type than would be necessary where the water requirement was more uniform. A raw water of variable composition, as a surface water, would further complicate matters. These and many other factors enter into the selection of equipment and the design of an appropriate water treatment system.

In the present case it is probable (and again local conditions would influence the decision) that a cold lime and soda softener, followed by either sulphuric acid neutralization or recarbonation would provide suitable process water for fine paper manufacture and pulp washing. It would be necessary to modify the softening treatment with appropriate clarification treatment so as to insure that the softening operation combined satisfactory hardness reduction with suitable color, turbidity, and iron removal. The selected equipment and treatment must be capable of effecting these results.

In this connection a special preliminary investigation by an experienced water engineer would be in order for the following reasons: Color in water is a highly variable constituent. Some types of color such as that caused by the presence of iron or manganese are readily and completely removable by a cold lime and soda softener; others are difficultly and only partially removable; still others cannot be adequately reduced even with the use of special auxiliary chemical treatment. Some colloidal organic coloring materials interfere with iron and manganese removal. Before installing expensive equipment it is necessary in such special cases to determine definitely that the proposed treatment system will yield the desired results.

It would probably be desirable and economical (and again local conditions might alter the decision) to further soften the water to be used for boiler feed purposes by passage of that fraction of the partially softened and neutralized water through a zeolite softener to effect complete softening. Even then an appropriate internal boiler treatment, properly controlled, would be necessary to insure absence of corrosion or scale formation, and suitable boiler operation.

Chlorination of that fraction of the partially softened and neutralized water to be used for potable purposes would be highly desirable.

For cooling purposes, the partially softened and neutralized water would undoubtedly require a small amount of further stabilization treatment to prevent corrosion or scale formation in the cooling system,

together with suitable treatment for the prevention or control of biological growths.

A water composition was selected to serve as an example in the present discussion which is comparatively simple to treat in order to fit it for the several purposes intended. The selection of an appropriate system of treatment is normally far less simple. Even so, it is apparent that the problem is not a simple one and it might be very much further complicated by local factors. It is apparent that under actual conditions the selection of a suitable water treatment system and of the equipment required is a difficult and complex problem requiring specialized engineering knowledge and information. A problem of this nature is best handled by a reputable firm of engineers specializing in water treatment.

Figure 1 outlines the hypothetical treatment system discussed here and is presented to clarify points omitted in the discussion.

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Paper-Base Laminates for Electrical Insulation*

By L. V. Larsen[1]

Abstract

Much of the insulation of electrical apparatus is accomplished through the use of paper-base laminated plastics. Some insight into the requirements for electrical insulation can be gained by breakdowns of electrical apparatus into component parts, showing special requirements for various parts. Thus high mechanical strength, high dielectric strength, low power factor, or high arc resistance are found as various requirements in the insulation of motors, transformers, or radio circuits.

By choice of different grades of paper and of impregnating varnish, paper-base laminates can be made whose properties can be controlled to emphasize nearly any desired property, whether electrical or mechanical. The types of paper in common use among the laminators are kraft, bleached sulphate, and rag or high alpha content paper. Some properties of typical papers of these classes are given, with an indication of possible uses to be made of these powers.

Finally a tabulation of properties of several grades of paper-base laminates is given, and the relation between paper type and physical properties of the finished laminate is shown.

The electrical industry uses a very considerable quantity of paper, of many varieties, as components of insulation. In some instances the paper may be applied as such, as for wrapping wires or coils, but mostly it is compounded with some insulating oil or resin into any one of a variety of forms for use in specific applications. One such form is the laminated plastic, which is commonly a combination of a phenol-formaldehyde resin with paper, appearing as a plate, a tube, or a rod ordinarily.

Insulation Requirements

Before going into detail on laminated plastics, the needs of electrical apparatus for insulation are reviewed briefly. Classifying by voltage rating, at one end the flashlight operates at 1.5 volts, and at the other end of the range the industrial x-ray operates at 2 million volts or more. There are applications for direct current, either smooth-flowing and uninterrupted as in a battery circuit, or pulsating as in ordinary rectified current circuits. In the realm of alternating current much power is being generated at 60 cycles, considerable at 25 cycles or 500 cycles, and radio applications at frequencies over practically the whole spectrum from a few hundred cycles into the millions.

For any type of electrical apparatus the requirements for insulation may be broken down into small sections each characterized by a particular need. In a motor operating at 440 volts a. c. there are coils of wire in the stator and in the rotor, bearing a potential between remotest ends of 440 volts, but the potential between adjacent turns is quite low. The wire is insulated with an enamel coat which must be abrasion resistant, resistant to flexing, nonbrittling with prolonged ageing at the ambient temperature, and have several other needs entering the balance of properties. The dielectric strength, or protection against shorting of turns through their insulation need not be high. To protect the coil from abrasion by the walls of the slots in the stator or the rotor, the slot is lined with an insulating tube of paper, laminated plastic, or vulcanized fiber. Here the dielectric strength needs to be higher because the voltage drop may be as high as the full 440 volts, the stator or rotor form being at ground potential.

The insulation in the commutator, between the bars, is characterized by high resistance to surface arcing, which may char the insulation and make it actually conducting. The insulation about the leads of the motor bear the full potential applied and must also be resistant to the effects of the environment of the motor in operation, moisture, dirt, grit, and grease.

Besides the electrical properties of the material, the

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insulation of rotating machinery such as motors, generators, frequency changers, etc. must be mechanically strong to endure the vibrations and particularly the centrifugal forces encountered.

The insulation of radio equipment brings different requirements. There are places in the plate circuit which are subject to a d.c. potential of the order of 5000 volts. In the output of power oscillators such as are used for high-frequency heating, voltages of the order of 10,000 volts at frequencies around a million cycles may be encountered. Parts of the radio circuit require very high grade insulation to prevent any loss of current at all. In these spots, the isolating quality of a vacuum is desirable. Then radio circuits have many uses for insulation at the level of 110 to 230 volts.

The insulation of transformers covers a variety of requirements. Large power transformers may deliver current at many thousand volts and the highest dielectric strength insulation is required to isolate the high potential portions from the grounded parts. Most transformers are insulated in their windings with oil, the containing tank being filled with the oil. Consequently, the other insulation, much of which is paper-base laminate is in more or less constant contact with oil and must not be impaired by this contact.

The various heating devices using electrical power need their insulation to be resistant to high heat for prolonged exposures without deterioration of the insulating quality.

While these pieces of apparatus do not typify even the classes of electrical apparatus, let alone enumerate the various individual pieces, they will serve to give us illustrations of some of the kinds of service required of electrical insulation. Now to the matter of the insulation itself.

Use and Properties of Paper

Laminated sheet insulation as made by the plastics industry is largely cloth, paper, glass cloth, asbestos cloth, or asbestos paper bonded with a phenolic resin almost universally. In general, the paper base laminates are found to furnish laminates of the best electrical properties and by proper choice of the grade of paper and the resin some particular property or group of properties of the finished laminate may be emphasized.

For example, by using a good grade of sulphate kraft with an ordinary phenolic resin [or more properly phenol-cresol formaldehyde resin], a laminate characterized by moderate electrical properties, as dielectric losses, very good dielectric strength, and very good mechanical strength may be obtained. If the resin content is on the low side, around 30% say, the moisture absorption is found to be high, and the value as insulation is very poor when wet. However, this low resin content makes for higher mechanical properties, as tensile or impact strength. Conversely, if a high resin content is used the fibers are impregnated and protected much better and the wet electrical properties improved, but at the expense of the mechanical strength.

The laminator uses kraft paper to a considerable extent for many of the insulation demands. He requires a very uniform sheet, of good absorbency, good strength, and accurate tolerance on caliper.

Kraft paper alone, if made of good pulp, has many uses in insulation as it has good dielectric strength and low power factor and dielectric constant. The addition of the phenolic resin stabilizes the moisture absorption tendencies of the paper however, and make it a much more reliable insulator.

The high mechanical strength of kraft paper is put to good use in the manufacture of laminated tubes. For this use thinner paper is used than for the sheet stock, but otherwise the requirements are similar.

Most paper-base laminated stock is fabricated in a punch press, the millions of small parts used for spacers, washers, coil forms, tube base supports, and the like being very economically turned out by that means. In order for the laminated sheet to punch properly it must be softer and more resilient than for sawing or shearing. The punch grades of paper base may be made from kraft paper with a plasticized phenolic resin, but better grades are made with rag paper.

The rag papers, or other high alpha papers, give the best electrical properties for radio insulation. Here the dielectric loss factor, as measured by the power factor and dielectric constant, must be kept at a minimum and the laminate must not be sensitive to water. The ordinary phenolic resins are not quite good enough for these grades and customarily an aniline-formaldehyde type of resin must be used.

The electrical properties of a paper-base laminate are largely reflected in the choice of the resin used. The class of water soluble phenolics seem like very useful impregnating varnishes because they pair high resin content with low viscosity, and relatively dense papers can be treated with ease. These resins, however, by virtue of their composition necessary to make them water soluble give electrically poor laminates. They also tend to be brittle. However, as these low viscosity resins do a better job of impregnating the micelles of the cellulose than do other resins, the finished laminate has superior resistance to water, and is dimensionally more stable under humid conditions.

Spirit soluble phenolic resins have a considerably higher viscosity for comparable resin contents, consequently thorough impregnation of the fibers is more difficult, and the laminator likes to use an uncalendered, absorbent sheet. Much of the resin content of the individual sheets which will be pressed to finished laminates is on the surface, and is driven into the plies in the pressing operation. These spirit soluble resins are electrically very inert, and the skilled laminator can use them to build up dielectric strengths of the order of a thousand volts per mil with a power factor of the order of 0.03.

As mentioned in the introductory remarks, surface arc resistance is often important, for instance in insulation adjacent to switches or relay points. The phenolic resins do not furnish very good arc resistance, as brief exposure to an arc causes carbonization in the arc path, leading to a breakdown. Where resistance to arcing is important, the phenolic laminate may be given a coat of a Glyptal alkyd resin varnish and good protection is afforded. If the paper-base laminate is made with a melamine resin, or a urea resin, instead of the phenolic the surface arc resistance will be quite high, of the order of 125 seconds as compared with less than 10 for the phenolic. The aminoplast resins [urea and melamine] however, do not give a favorable balance of properties and are seldom used in electrical grade laminates. Their big use is in the manufacture of nameplates and related types of laminate.

Specifications

For a cross section of the requirements for papers some specifications are examined:
For a kraft paper:

Width, inches	38
Thickness, inch	0.0102–0.0118
Air resistance, seconds per 400 cc.	8–16
Oil penetration, seconds	3–5
Absorbency, min.	20
Color	Natural
Wet tensile MD, ounce min.	17
CD, ounce min.	9
Moisture, % max.	6
Ash, % max.	1.0
Acidity	Neutral

As shown above, this kraft is a general purpose filler stock, which can be used for ordinary grades of insulation, mechanical properties being very good.
For a bleached sulphate paper:

Width, inches	38
Thickness, inch	0.0102–0.0118
Air resistance, seconds per 400 cc.	8–16
Oil penetration, sec.	2–5
Color	White
Wet tensile, MD, ounce min.	60
CD, ounce min.	40
Moisture content, % max.	6
Ash, % max.	1
Acidity	Neutral

This paper is used where a higher quality of electrical insulation, as regards dielectric losses, is concerned. It is also used in making tubes, though in thinner stock ordinarily.
For a high-alpha paper:

Width, inches	38
Thickness, inch	0.0038–0.0042
Air resistance, seconds	85–100
Oil penetration, seconds	4–6
Wet tensile MD, ounce min.	38
CD, ounce min.	19
Moisture, % max.	6
Ash, % max.	1
Acidity	Neutral

This paper is used in making tubes for high dielectric strength applications, and elsewhere where superior electrical properties are required. On a number of the paper base laminates, the outer face sheet is often made of a high-alpha cellulose content paper which is colored.

Representative laminates made from some of these papers have properties as follows:

Filler	Kraft	Bleached Sulphate	High Alpha
Dielectric strength, S.T.O., v./m.	800	885	850
Moisture absorption, %	3.11	1.53	0.78
Power factor, 1 mc., dry	0.046	0.040	0.034
wet	0.052	0.046	0.038
Diel. const., 1 mc., dry	5.8	5.0	5.0
wet	6.0	5.4	5.4
Loss factor, 1 mc., dry	0.27	0.20	0.17
wet	0.31	0.25	0.21
Tensile, lengthwise, psi.	20,600	14,500	13,100
crosswise, psi.	16,000	11,100	10,500
Flexural, lengthwise, psi.	21,700	23,500	19,300
crosswise, psi.	22,200	18,900	18,400
Izod impact, per in. of notch, ft. lb.	2.5	3.9	2.7

It will be noted how good electrical properties are obtained, in general, at the expense of mechanical properties. It is for this reason that a number of grades of laminated paper base are manufactured, so that practically any single desired property may be offered with a fair balance of the other properties.

The state of development of laminated paper-base plastics represents a cooperative effort between the plastics technician and the paper manufacturer. New developments during the war point the way to extended uses of papers in plastics, and after the war the manufacture and development of the many and beautiful decorative varieties of laminated plastics, which have not come within the scope of this paper, will be with us again.

TAPPI Notes

Harold E. Ingalls, formerly of the Continental Paper Company, is now chief engineer for the Bedford Pulp and Paper Company, Big Island, Va.

Edwin H. Graves, formerly of the American Viscose Company is now assistant manager of the Hummel-Ross Fibre Corporation, Hopewell, Va.

Mrs. Hildegarde Buffington formerly of the Sylvania Industries, Inc. is now a student at Stanford University, Berkeley, Cal.

St. Joseph's College, 54th St. and City Line Ave., Philadelphia, Pa. having completed its pulp and paper course under the ESMWT Program will start a ten week course in the Chemistry and Techniques of Paper Conversion, beginning on March 5th. The course will consist of a laboratory round table discussion type of instruction under the direction of George F. Fronmuller of the Scott Paper Company. The topics to be considered are pulp preparation, sizing, pH, bleaching, tub-sizing, loading, impregnation, coating, adhesives, expansivity and the preparation and theory of emulsions. Individuals interested should write to the Office of the Director of Engineering, Science, Management War Training Program at St. Joseph's College.

Engineering and Machine Shop Terms

The Chemical Publishing Company has recently issued a Dictionary of Engineering and Machine Shop Terms by A. H. Sandy, Instructor in the Mechanical Engineering Department, Borough Polytechnic, London. The present first American edition is revised by I. E. Berck, 153 pages, 5½ x 8½. Compiled in this handy volume are the definitions of many important terms used in machine shops, industries and engineering literature, as gathered by the author over a long period. It is useful to students of engineering, foremen and mechanics.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd street, New York 17, N. Y., at $2.75 per copy.

Many Mill Workers Donate Blood

Many workers in paper and other mills at Menasha, Wis., have volunteered as blood donors, according to Mr. George Banta, Jr., chairman of the blood donor committee. Heads of the appointment committees at various plants include: Marathon Corporation, Joe Fagot; Gilbert Paper Company, Clarence Elmgren; George Banta Publishing Company, Miss Mildred Alger; John Strange Paper Company, Mrs. Gert Kellett; Wisconsin Container Corporation, Miss Agnes Levandowski; Edgewater Paper Company, Gavin Young; Central Paper Company, Stuart Thompson.

TAPPI New England Section to Meet

The New England Section of the Technical Association will meet at the Elks Club, Fitchburg, Mass., at 6:30 P.M. Friday, March 16, 1945. The subject for discussion will be Characteristics of Coating Base Raw Stock and the speakers will be Earle Barclay, Kupfer Brothers Company, Northbridge, Mass. and Norman I. Bearse of the Champion International Company, Lawrence, Mass. Individuals planning to remain in Fitchburg overnight should make reservations at the Hotel Raymond.

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KALAMAZOO • MICHIGAN

CAMACHINE 9-5

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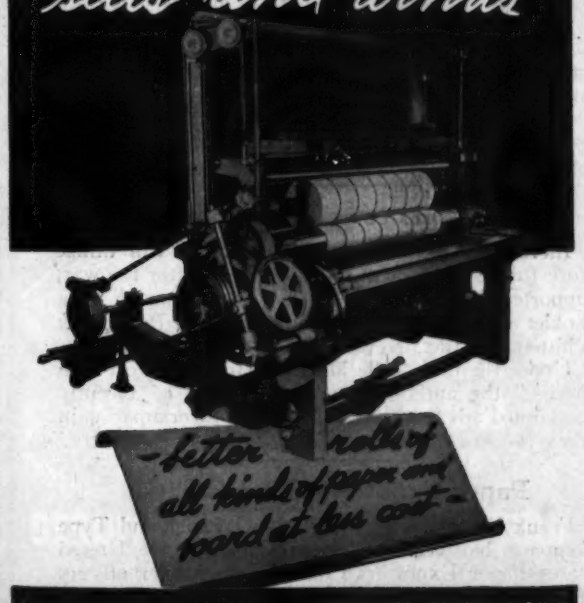

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Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Charleston, South Carolina

New York Paper and Pulp Market Review

Heavy Demand For Many Types of Paper Keeps Supply Situation Tight—Wood Pulp Supply Expected To Continue Tight—Board Mills Urgently Need More Waste Paper To Avoid Closing Down.

Office of the PAPER TRADE JOURNAL,
Wednesday, February 28, 1945.

Heavy demand for all major types of paper continues in the wholesale market. In view of the reported increasing demand in government purchases in 1945, less paper for civilian uses is currently indicated for the first half of this year, possibly for a more extended period. Opinion in some quarters is not encouraging for any improvement even when the conflict in Europe is terminated. The prevailing opinion seems to be that a tight supply situation in paper and wood pulp may be expected until near the end of the current year.

The index of general business activity for the week ended February 17 rose to 143.5, from 141.2 for the preceding week, compared with 145.5 for the corresponding week last year. The index of paper board production was 149.8, compared with 149.4 for the preceding week, and with 148.6 for the corresponding week last year.

Paper production for the week ended February 17 was estimated at 91.0%, compared with 89.2% for 1944, with 89.0% for 1943, with 103.8% for 1942, and with 89.6% for the corresponding week in 1941.

Paper board production for the week ended February 17 was 96.0%, compared with 96.0% for 1944, with 91.0% for 1943, with 102.0% for 1942, and with 80.0% for the corresponding week in 1941.

The index value of manufacturers' shipments of paper and allied products, reported by the Department of Commerce, was 172 in December, 1944, compared with 179 in November, and with 180, the high of the year in October. This compares with a December index figure of 279 for all industries, with 392 for durable goods and with 201 for non-durable goods. The index value of manufacturers' inventories for December, 1944, for paper and allied products was 135.4, compared with 136.2 in November and with a high of 144.7 in August for last year. This compares with a December index figure of 168.1, with 170.8 in November, and with 179.1 in January, the high mark of last year. The index figure for non-durable goods was 147.3, compared with 150.4, the high of the year in January, 1944.

Wood Pulp

Wood pulp continues in very tight supply. No expectancy of any improvement is reported in the industry and trade. The large demand is in excess of supplies. While this week's report from Canada reflects a very favorable pulpwood cut for the year, more manpower must be made available to step up domestic production or more farmer wood must be harvested to attain the year's goal of 16,000,000 cords, which is the minimum estimated need for 1945.

Rags

Demand for cotton cuttings is active at this date. Mill purchases continue to absorb about all limited supplies. All grades are in relatively heavy demand. Prices are strong at ceiling levels.

Mill demand for the roofing grades of old cotton rags is relatively heavy at this date. Late reports indicate that mill orders are being received in excess of current supplies. Prices are firm at ceiling levels.

Old Rope and Bagging

Mill demand for good Manila rope continues urgent, with supply limited and inadequate to meet heavy demand. Other hard fibers are in moderate to good demand at this date, with supplies relatively large. Jute is reported in good supply and demand at this date is fair. All prices are unchanged.

Old Waste Paper

Demand for paper stock continues active. More waste paper is urgently needed to maintain operations of many board mills, otherwise more paper board mills must be shut down. Collections in January declined 8% below the monthly average of last year and the WPB requests householders and commercial firms to increase their waste paper salvaging. Receipts totaled 537,326 tons in January; consumption was 579,308 tons. The inventory of 272,589 tons is below the safety mark.

Twine

No important change has been reported in the twine market this week. Demand is moderately active. Prices are relatively firm and continue with no important changes at this date.

Amends Paper Machinery Order

The paper mill machinery Order L-83, which restricts the delivery of new paper mill machinery was amended February 23, 1945 to include new parts as well as complete machines and equipment used in the manufacture of pulp, paper, paper board, including container board, and converted paper products, the War Production Board announced.

The order does not restrict delivery of machinery used in producing fiber shipping containers, folding cartons and set-up boxes, it was pointed out.

Idle Machines or Post-War Profits

Increased production of paper which will utilize more fully surplus manpower available after the war, supported by increased exports, is discussed in a booklet by J. Francis Strub, issued by Parsons & Whittemore, Inc., New York.

Under the title, "Idle Machine Hours or Post-War Profits," the author presents "a digest of recently proclaimed advantages American producers may gain in overseas markets correlated for the paper industry."

Paper Exporters Elect Officers

Frank W. Smith of the National Paper and Type Company has been elected president of the United States Paper Exporters Council, Inc. Other officers of the organization are Fred C. Strype of Fred C. Strype, Inc., vice president and Harry Bengtsson of the Van Reekum Paper Company, secretary-treasurer.

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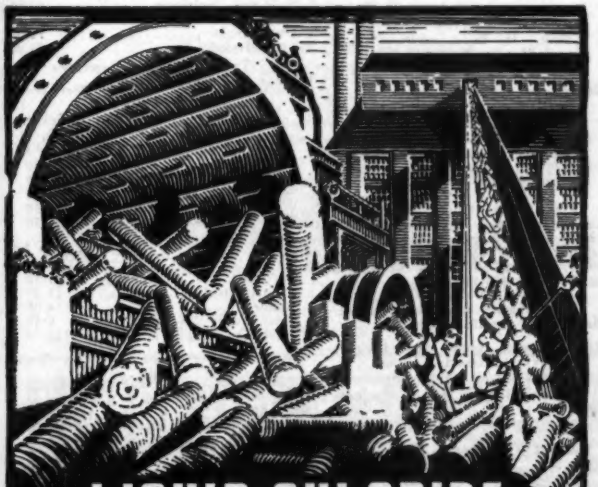

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, February 28, 1945.

BLANC FIXE—The market for blanc fixe continues without change, for the week. Current demand is reported fair. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton.

BLEACHING POWDER — Current demand is reported active. Supply situation reported satisfactory. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b. shipping point.

CAUSTIC SODA—Supply situation continues tight, with production high and very heavy all-over demand. Deliveries delayed by traffic congestion. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CHINA CLAY—Demand for some grades of china clay is reported fair this week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE — Production reported at high rate. Demand for all uses heavy. All essential requirements fulfilled. Deliveries delayed by transportation difficulties. Prices remain unchanged. Chlorine is quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—Prices are quoted unchanged at ceilings in most grades of rosin this week: OPA ceiling prices prevail on "G" gum rosin at $5.79 per 100 pounds, in barrels, Savannah. "FF"" wood rosin is currently quoted at $5.75 per 100 pounds in barrels, New York. Seventy per cent gum rosin is currently offered at $6.06 per 100 pounds, f.o.b. works.

SALT CAKE—Demand reported moderate. Quotations on salt cake continue to remain unchanged. Domestic salt cake is currently quoted at $16 per ton.

SODA ASH — Market requirements for soda ash continue heavy. Production at capacity. Market tight. Deliveries behind schedule. Prices continue unchanged. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Market supply of corn reported in good volume this week. Corn prices are steady. Starch quotations continue unchanged. Pearl is currently quoted at $3.72 per 100 pounds. The powdered grade is currently quoted at $3.83 per 100 pounds. All prices f.o.b. Chicago.

SULPHATE OF ALUMINA—Supply situation is reported good. Quotations are unchanged. Prices on the commercial grades are quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.85 per 100 pounds. All prices in car lots, in bags, f.o.b. works.

SULPHUR—Demand is reported steady for sulphur. Quotations on all grades continue unchanged. Annual contracts are currently quoted at $16 per long ton, f.o.b. mines. The current contract prices at Gulf Ports remains unchanged at $17.50 per long ton.

TALC—The market for domestic talc is reported fair this week. Quotations unchanged. Domestic grades are quoted at from $16 to $21 per ton, at mines.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract...	*$58.00	@	—
Sheets	66.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping ....*	$5.25	@	—
No. 1 Wrapping... *	5.00	"	—
Standard Wrapping*	4.75	"	—
Standard Bag.....*	4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1.....	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½....	1.00	"	—
White No. 2.....	.90	"	—
Anti-Tarnish M.F..	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet....	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.....	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute.....	11.25	@	—
No. 1 Manila Wrapping, 35 lb....	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.....	5.75	"	6.00
Boards, per ton—			
News .....*	50.00	@	—
Chip .....*	50.00	"	—
Sgl. Mla. Ll. Chip *	62.00	"	—
White Pat. Coated*	75.00	"	—
Kraft Liners 50 lb.*	63.00	"	—
Binders Boards...	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Ext. No. 1	$39.10@$46.00		$40.25@$47.25
100% Rag	32.20 " 37.75		33.35 " 39.25
85% Rag	.... "		29.90 " 35.00
75% Rag	23.00 " 27.00		24.15 " 28.25
65% Rag	.... "		22.80 " 27.75
50% Rag	18.70 " 22.75		19.90 " 24.25
25% Rag	16.40 " 20.00		17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
No. 1..	$10.55@$12.75		$11.70@$14.25
No. 2..	9.65 " 11.75		10.80 " 13.25
No. 3..	9.20 " 11.25		10.35 " 12.50
No. 4..	8.90 " 10.75		10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated...	$13.65	@	$13.30
No. 2 Glossy Coated...	12.40	"	14.00
No. 3 Glossy Coated...	11.60	"	13.20
No. 4 Glossy Coated...	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.....	9.35	"	10.75
A Grade S. & S. C..	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C...	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite.....	$86.00
Unbl. Softwood Sulphite.....	74.00
Bl. Hardwood Sulphite.....	83.50
Unbl. Hardwood Sulphite.....	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich ...72.00 @	82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate...	82.00
S. Semi Bleached Sulphate...	75.00
N. Unbl. Sulphate.....	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	72.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weigh
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)....	10.50
West Coast (out area).....	16.50

	50% 80% Air Dry Weigh
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area).....	9.50
West Coast (out area) ..	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weigh
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area) ...	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1..	6.50	@	7.25*
Silesias No. 1.....	—	"	5.75*
New Unbleached...	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.

ARE YOU READY FOR "V" DAY?

Prepare NOW to Take Care of Increased Orders Which Will Come. Consider Necessary Repairs and Maintenance.

Also New Equipment of Improved Designs and Efficiency.

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CAST • ROLLED • FABRICATED

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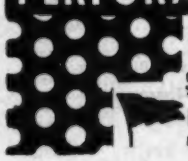

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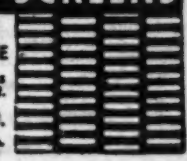

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Old Rags

White, No. 1—			
Repacked	*3.80	@	—
Miscellaneous	*3.20	@	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Mogging Rags—			
No. 1	*1.55	@	—
No. 2	*1.45	@	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.25	@	4.35
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	5.00
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

*OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.90	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—
Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.90	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.36	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.15	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill.)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¼
Light Silesias	.05¼
Black Silesias, soft	.03¼
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable shredding	.01¼
Fancy Percales	.04¼
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	@	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	@	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	@	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	@	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	@	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	4.50
No. 1 Clean bright—			
Sisal Strings			.04
No. 2 Clean bright—			
Sisal Strings			.03
Sisal Jute	.02½	@	.02¾
Scrap—			
No. 1	1.25	@	1.30
No. 2	1.75	"	1.80
Wool Tares, bur	4.00	@	4.25
No. 1 New Light Burlap	3.00	@	4.00
New Burlap Cuttings	1.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings			

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	—	@	2.50
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	*4.25	"	—
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	5.25	"	—
Jute Car Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	—	"	2.75
South American	—	"	3.00
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	—	"	3.00
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

*OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¼	"	.05
New White No 1.	.06¼	"	.07
New Light Flannelettes	.05¼	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06¼	"	.06½
Underwear Cutters, Unbleached	.05¼	"	.06
Silesias No. 1	.06	"	.06½
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¼	"	—
Washable	.02¼	"	—
Khaki Cuttings	.02¼	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.06¼	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.30
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.30	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)		
Dark Cottons	(nominal)		
Dutch Blues	(nominal)		
New Checks and Blues	(nominal)		
Old Fustians	(nominal)		
Old Linsey Garments	(nominal)		
New Silesias	(nominal)		

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	@	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—

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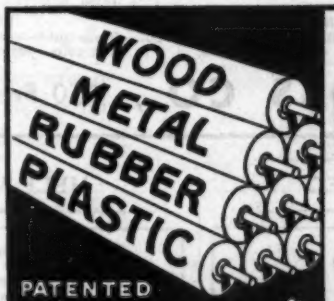

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1—1200 lb. Stout, Mills & Temple Iron Tub Beater.
1—500 lb. Gavit—iron tub beater.
2—400 lb. Gavit—iron tub beaters.

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1—11-Roll 92" Face Calender Stack—complete with Drive.
1—36" 7-roll—Holyoke Machine.
1—77" 2-roll—Moore & White.
1—86" 5-roll—Black-Clawson.

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1—7 roll 50" face.
1—7 roll 44" face.

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1—Shartle Brothers Centrap.

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1—48" Diameter x 96" Face.
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1—30" diameter x 71" face.
1—36" diameter x 90" face.

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2—D. O. James 75 H.P. Speed Reducers with couplings and motor bases. Ratio 2.16 to 1. 900 RPM to 418 RPM.

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18—Dryers — 36" Diameter x 94" Face — complete with 2-deck Frames, etc.
1—48" diameter x 94" face.
2—36" x 44" face—with frames and bearings.
1—24" diameter x 84" face. (Baby).
1—16" diameter x 84" face. (Baby).
3—36" diameter x 116" face.
2—28" diameter x 68" face.

EMBOSSER

1—28" two roll Embossing Calender.

ERKENSTATORS

3—I. W. E. Erkenstators—bronze construction—complete with motors, starters and distributing box.

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1—Packer type 14 plate flat screen — with Witham fasteners and scraping devices.

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1—600 ton Dunning & Boschert hydraulic Pulp Baling Press—low and high pressure hydraulic pump, valves, piping, etc.—Platen 38" x 38"—ram 20" diameter—daylight 50"—stroke 36".

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1—Black-Clawson Jordan (belt driven).
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1—100 H.P. General Electric Synchronous Motor—450 R.P.M.—Late type, including starting equipment.
1—Westinghouse—75 H.P.—1200 R.P.M.

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1—45" Black-Clawson paster.

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1—Eaton, Cole & Burnham Company pipe threader—2" to 8"—complete with dies.

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1—84" Carthage Chipper—complete and in excellent condition.
1—32" three pocket Glens Falls Grinder (for 27" wood).
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2—Jones Pulpers—direct connected to 60 H.P. motors—3 phase, 60 cycle, 440 volts —forward and reverse starting.

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1—2 Bowl Reel—63" face.

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2—#5 Bird Savealls.
1—North Save-all—cylinder mould 72" diameter x 100" face.

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1—Jeffrey swing hammer type shredder—size 24" x 18"—antifriction bearing equipped.
1—#25 CRSE Mitts & Merrill Hog.
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1—Taylor Stiles #5 Pulp Shredder.

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1—103" Hamblet Single Knife Sheeter — complete with Slitting Device.
1—110" Horne single knife rotary sheet cutter.

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1—114" Two drum Langston Slitter and Winder.
1—110" Beloit slitter (slitter attachment only)
1—114" Two drum Kidder slitter and winder.
1—60" Kidder slitter and winder.

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1—Nash 125" face Suction Box.
3—Brass Suction Boxes—90" drilled face.
2—Brass Suction Boxes—77¾" drilled face.

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1—Sandusky Suction Couch Roll — 18" diameter x 130" face — Complete with Sturtevant Vacuum Pump and drive mechanism.

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1—18" diameter x 94" drilled face.

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M-22

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WANTED—Foreman and operator for web style printing operation in Bag Plant. Experience on Potdevin Press desirable but other web style experience acceptable. Pittsburgh, Penna. area. M-1

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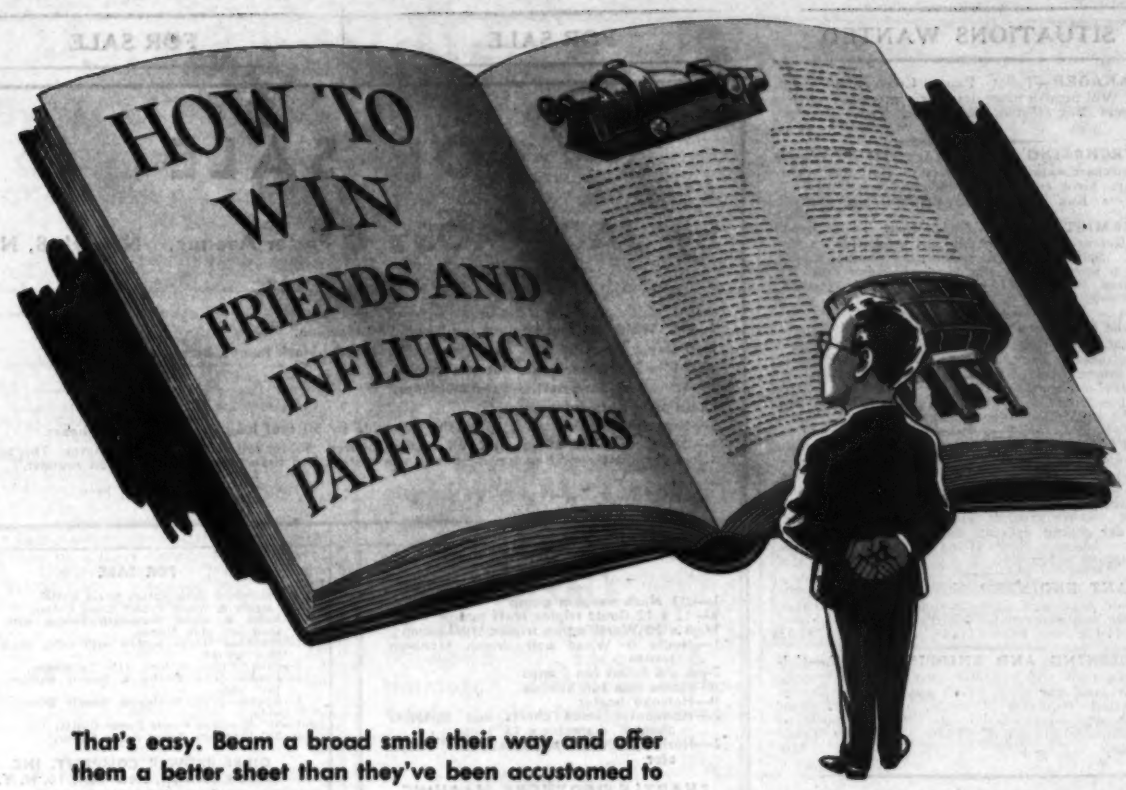

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Yes, gentlemen, follow the above suggestion and you'll be producing "Hydrafined" grades—the best way in the world to win friends and influence paper buyers.

DILTS MACHINE WORKS
FULTON, NEW YORK
Shartle Bros., Middletown, Ohio
Divisions of Black-Clawson Co., Hamilton, Ohio

Dilts

Hydrapulpers - Hydrafiners

SITUATIONS WANTED

MANAGER—Toilet Paper Converting Plant. Will furnish more details to interested parties. Address Box 45-106 care Paper Trade Journal. M-22

PURCHASING AGENT—Age 30 to 40. Volume purchase experience necessary. Post war opportunity. Give complete resume and salary desired. Address Box 45-121 care Paper Trade Journal. M-15

CHEMIST—Ph. D., Mass. Inst. Tech. Broad Research, development and executive experience. Sulfite pulping, tissues, absorbent papers, coated papers and adhesives. Member TAPPI. Address Box 45-107 care Paper Trade Journal. M-8

EXECUTIVE, PAPER—Experienced in manufacture, buying and paper sales. Excellent background. Thoroughly familiar domestic fine and coarse paper sales and export requirements. Desires connection as mill representative, sales manager, purchaser for exporter. Address Box 45-120 care Paper Trade Journal. M-1

SUPERINTENDENT—now employed, desires to make change. Twenty years' experience, cylinder machine specialties. Training and experience personnel, labor relations, organization, stock furnish, beating, dyestuff, fibre analysis, maintenance some ground wood experience. Might consider selling dyestuff felts or paper mill supplies. Address Box 45-108 care Paper Trade Journal. M-8

PLANT ENGINEER with many years experience in design, construction and maintenance of pulp and paper mills, desires position. Address Box 45-128 care Paper Trade Journal. M-15

FINISHING AND SHIPPING SUPT.—College man will consider change. Is energetic and a good executive. Will guarantee results as to output, reduction of waste, best use of manpower and operational costs. Prefers northern location. Address Box 45-130 care Paper Trade Journal. M-1

FOR SALE

FOR SALE

1—Emerson Jordan 15 ton capacity with 75 HP motor
1—Arbor hydraulic press, in very good condition, with pump
1—Horne patent beater, 4' tub, bronze bars, ⅝" wide, excellent condition
1—Niagara Beater
2—10 x 10 Beloit triplex stuff pumps
2—8-plate and 2 10-plate flat screens
1—No. 2 Lannoye pulper
2—Moore & White rotary screens
1—Mammoth Junior Jordan with new filling
2—2000 lb. Midwest Fulton high speed iron tub beaters, rolls 61 x 60".
2—44" Nurwood Platers
1—14" x 86" Sandusky Suction Couth Roll
1—No. 2 Dilion Jordan
1—154" Waldron Flat Brush Coater with two 180° turn arounds.
2—Appleton Jordans No. 2, 6 years old, anti-friction equipped, ⅝" bronze filling, motor driven.

FRANK H. DAVIS CO.
175 Richdale Ave., Cambridge 40, Mass.
M-1

PAPER MILL EQUIPMENT FOR SALE

65" Hamblet Sheeter with 4 slitters—with or without 6-roll backstand.
110" Hamblet Sheeter with 3 slitters and 4-roll backstand.
45" White Automatic Power Cutter.
68" Rice Barton & Fales Slitter & Rewinder, for use on dry end of paper machine.
63" Oswego Mill Type Cutter.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18, N. Y.
TF

FOR SALE

1—Carthage four pocket grinder
1—1000 H.P. synchroneous motor for grinder

SHARTLE BROS. MACHINE CO.
Middletown, Ohio M-1

FOR SALE—4 - 36" Waldron Paper Reels; 36" Waldron Roller Embosser. Address Box 45-104 care Paper Trade Journal. M-1

FOR SALE

FOR SALE

1—#1 Nash vacuum pump
3—12 x 12 Gould triplex stuff pumps
1—8 x 10 Worthington triplex stuff pump
1—Noble & Wood belt driven Monarch Jordan
2—8 x 6 Beloit fan pumps
2—Horne iron tub beaters
1—Holyoke beater
2—Horizontal wood chests and agitators about 8' diameter x 13' long
2—Horizontal wood chests about 9' diameter

SHARTLE BROTHERS MACHINE COMPANY
Middletown, Ohio
M-22

FOR SALE

1—Complete 98" Fourdrinier Paper Machine with 26 Dryers, 48" diameter x 96" face, including auxiliary equipment. Additional details on request.

J. J. ROSS COMPANY
250 Frelinghuysen Ave., Newark 5, N. J.
Telephone Bigelow 3-3720 F-22

FOR SALE

1—Dilts Beater—good shape—Cast Iron Tub—Roll 62" x 54".

Address Box No. 45-119 care Paper Trade Journal. M-1

FOR SALE

New and guaranteed used steel pipe, boiler tubing, valves, fittings, wood and steel tanks, steel buildings

JOS. GREENSPON'S SON PIPE CORP.
NATIONAL STOCK YARDS, Illinois.
S-6

FOR SALE—One Hudson Sharp hard wound toilet tissue rewinder — 3 bars — cuts sheets 4½ x 5" - 4½ x 4½ - 11 x 15 - 11 x 13½ - 11 x 7½ without motor. Address Box 45-91 care Paper Trade Journal. M-8

FOR SALE — NEW #2 LANNOYE PULPER. ADDRESS BOX 45-112 CARE PAPER TRADE JOURNAL. M-15

FOR SALE

by JACK ROSS 17 Porter Avenue, Newark 8, N. J.

Waverly 3-5675

1—44" Waldron Drum Reeling and Rewinding Machine.
1—Pusey & Jones 5" x 8" open impeller Centrifugal Stock Pumps. Belt driven.
4—14" x 20" Connersville Vacuum Pumps.
3—12" x 18" Connersville Vacuum Pumps.
These pumps are fully rebuilt.
5—New Fourdriniers, wires 75 mesh, 75" wide by 50 foot long. Now in original boxes.
1—Downingtown 2500 lb. iron tub cyclone beater. Beater roll 60" face, 72" diameter. This beater in excellent condition having been in operation less than two years. Prints on request.

M-1

FOR SALE

45" Standard Beck Rotary Sheet Cutter.
62" Moore & White Rotary Sheet Cutter.
1—Noble & Wood Mammoth Jordan with new shell and plug fillings.
1—Standard Horne Jordan with extra shell and plug fillings.
1—Oliver Filter, 8' long, 11'-6" diameter.
1—Double drum Bagley & Sewall Winder. 140" 104" wide.
1—Double--drum Bagley & Sewall Winder, 140" wide.
1—65" Sheridan Power Paper Cutter.
1—60" Standard Power Paper Cutter.

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y.
TF

FOR SALE

1—Hydraulic Press with frames, capable of handling shafts 15 ft. long
1—No. 17 Foote-Burt three spindle drill
1—3A Mitts Merrill Keyseater
1—42" Bickford radial drill press
1—75 KVA gasoline engine, portable generator set
1—Small 9 KVA unit

FRANK H. DAVIS CO.
175 Richdale Ave., Cambridge 40, Mass.
M-15

FOR SALE

4—Cylinder molds 60 x 169 with vats and rubber covered couchers. Anti-friction bearings can cut down.

Box No. 45-125 care Paper Trade Journal.
M-8

FOR SALE—65" Moore & White Slitter, with 125 sets of knives shear cut. Address Box 45-105 care Paper Trade Journal. M-1

FOR SALE—50" Sheridan New Model Cutter good working order. Address Box 45-117 care Paper Trade Journal. F-22

FOR SALE—4 slightly used Broughton No. S-10-xm Oscillating Showers for 104½" Cylinder Mould. Sonoco Products Co., Hartsville, S.C. M-1

FOR SALE — Standard Meisel Rotary Spot Sheeter, size 36" x 48". For further particulars address Box 45-114 care Paper Trade Journal. F-22

FOR SALE—One six-inch, two stage Warren Pump, with extended base for direct connected motor. 900 gallons per minite. Develops 250 foot head. 1150 RPM. Pump in operation only a short time. Address Box 45-115 care Paper Trade Journal. F-22

FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24". Also Triple-Deck Frames for ninety 36" dryers, any width. The Chesapeake Paperboard Co., Baltimore, 30, Md. TF

MACHINERY WANTED

By JACK ROSS 17 Porter Avenue, Newark, 8 N. J.

Waverly 3-5675

Cash purchaser of all types of paper, pulp and converting equipment.
From single items to complete plants.
Write, telephone or wire whatever you have for sale.

FOR SALE

FOR SALE—Meisel spot sheeter and layboy 48". American Decalcomania Co., 4334 West Fifth Avenue, Chicago, 24, Ill. M-8

FOR SALE—CLAFIN REFINER, belt driven 30" dia. grinding plates. Write for further details. Address Box 45-94 care Paper Trade Journal. M-8

FOR SALE—ONE 70 INCH WALDRON COATER IN GOOD CONDITION. ADDITIONAL INFORMATION FURNISHED UPON REQUEST. Address Box 45-124 care Paper Trade Journal. M-8

FOR SALE—One Paper Shredding Machine for shredding tissue paper and wax paper ¼" width from sheets or rolls. One steel Herringbone Embossed Roller, one steel Cobweb Embossed Roller, both approximately 8" diameter, 34" long. Also Paper Rolls to match, including gears. Address Box 45-123 care Paper Trade Journal. M-1

FOR SALE—Valley Iron Works 100 lb. Batch Beater; 2-Rosback 42" Confetti Machines. BRILL EQUIPMENT COMPANY, 225 W. 34th Street, New York, 1, N. Y. M-8

FOR SALE—Complete Paper Tube Plant, 2 Langston Spiral Winders, 1 heavy duty winder for Paper Cores; Tube recutters and tools, mandrels, etc. Paperboard slitter, Paper Cap Punch Press and Dies. Reasonable for quick sale. THEO. ADAMS, 111 W. Washington Street, Chicago, 2, Illinois. M-8

FOR SALE at Kaukauna, Wisconsin. Land and buildings. Railroad siding. Three 150 hp HRT boilers, two equipped with brand new Riley-Jones stokers, one equipped with American Cokal stoker. Plenty of water for manufacture. Write or telephone Sangamon Paper Mills, 3915 South La Salle Street, Chicago, Ill. M-1

FOR SALE—1-Oliver United American Continuous Vacuum Filter, right hand, 8'-6" diameter, 6 disc bronze sectors covered with 5 mesh bronze backing wire; two extra bronze sectors arranged for direct connected motor drive. Address Box 45-129 care Paper Trade Journal. M-8

FOR SALE—50" Seybold Automatic Clamp Cutter, throroughly rebuilt and fully guaranteed. Address Box 45-131 care Paper Trade Journal. M-1

WANTED

WANTED

CALENDER STOCK—10" INTERMEDIATE ROLL MINIMUM
ALSO
SHEETER—SINGLE OR DOUBLE CUT-OFF BOTH FOR 72" MACHINE

Address Box 44-728 care Paper Trade Journal. TF

WANTED

One (1) Laboratory Beater
Waterbury Hydraulic Drive size 5
11—60" Diameter x 92" Face Dryers
16—48" Diameter x 92" Face Dryers
4—36" Diameter x 92" Face Dryers

with gears, frames, felt rolls and cone pulley drives. Address Box 44-708 care Paper Trade Journal. TF

WANTED

WANTED

One Beater of 1,000 lb. capacity. Give complete description, specifications and price.

FOR SALE

42 Dryers consisting of 85" and 86" face—36" diameter, complete with triple deck stands, gears, bearings and piping.

EMPIRE BOX CORPORATION
Garfield, New Jersey
TF

WANTED—Any Item of Paper Tube and Paper Can Machinery, Slitters, Tube Winders, Cutters, etc. etc. We will buy such machinery in any condition. Theo. Adams, 111 W. Washington St., Chicago, 2, Ill. TF

WANTED—Tachascope or similar device for measuring length of moving felt. Must have clutch. Address Box 45-90 care Paper Trade Journal. M-1

WANTED — Second-hand spiral tube-making machine suitable for toilet paper tubes, complete with automatic cutting-off device if available. Address Fort Howard Paper Company, Green Bay, Wis. M-8

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 44-835 care Paper Trade Journal. tf

WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS: GLASER AND YOFFE, INC., 80 NORTH MAIN ST., NATICK, MASS. TF

WANTED—Brightwood Box Machine. Address Box 44-836 care Paper Trade Journal. tf

WANTED

Cylinder machine to trim from 75" to 100".

SHARTLE BROTHERS MACHINE CO.
Middletown, Ohio
M-22

CLASSIFIED ADS BRING RESULTS

BLANKETS

Converted From Your Used Felts

Write for Full Details

BLOOMFIELD WOOLEN COMPANY
BLOOMFIELD, IND.

PROPOSALS

FOR FURNISHING

PAPER FOR THE U. S. GOVERNMENT PRINTING OFFICE

SEALED PROPOSALS will be received until 10 a. m., March 12, 1945, in the room of the Joint Committee on Printing, in the Capitol, Washington, D. C., for furnishing the paper for the public printing and binding, and blank paper for the use of the Government departments and establishments in the District of Columbia, for the term of three months, beginning April 1, 1945; deliveries to be f. o. b. Government Printing Office Warehouse, or warehouse siding, Washington, D. C. The proposals will be opened in the presence of and the award of contracts made by the Joint Committee on Printing to the lowest and best bidders for the interest of the Government whose bids are in conformity with the requirements of the proposal. The Committee reserves the right to reject any or all bids, or to accept any bid or any part and reject the other part, if, in its opinion, such action would be in the interest of the Government.

Blank proposals containing the instructions, schedules, and specifications may be obtained by addressing A. E. Giegengack, Public Printer, Washington, D. C.

Contracts will be entered into for supplying the quantities required, whether more or less than the estimates, as provided in paragraph 15 of the instructions.

The approximate estimated quantities set forth in detail in the schedule comprise:

PAPER

1,500,000 pounds newsprint paper; 150,000 pounds telephone book news; 1,880,000 pounds machine-finish book paper; 3,500,000 pounds offset book paper; 110,000 pounds lightweight machine-finish book paper; 40,000 pounds 50% antique book paper; 1,300,000 pounds supercalendered book paper; 3,800,000 pounds machine-coated book paper; 400,000 pounds coated book; 3,200,000 pounds mimeograph paper; 500,000 pounds duplicator copy paper; 100,000 pounds U S M O safety writing paper; 15,450,000 pounds writing paper; 1,257,000 pounds map paper; 715,000 pounds manifold paper; 2,500,000 pounds bond paper; 1,440,000 pounds ledger paper; 1,980,000 pounds index paper; 290,000 pounds cover paper; 40,000 sheets cloth-lined cover; 180,000 pounds manila paper; 300,000 pounds kraft paper; 600,000 sheets white gummed paper; 40,000 pounds blotting paper; 40,000 pounds manila tag board; 530,000 pounds calendered tag board; 180,000 sheets railroad board; 200,000 pounds tan bristol board; 540,000 pounds wood bristol; 3,600,000 pounds postal card bristol; 500,000 pounds news board; 470,000 pounds binder's board; 40,000 pounds chestnut cover board.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

By direction of the Joint Committee on Printing.

A. E. GIEGENGACK,
Public Printer.

WASHINGTON, D. C.,
February 27, 1945. M-8

WHERE TO BUY

ABRASIVES
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Monsanto Chemical Co.
Norton Co.

ADHESIVES
Arabol Mfg. Co.
National Adhesives Division of National Starch Products, Inc.
Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
United States Rubber Co.

AGITATORS
Appleton Machine Co.
Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
H. K. Porter Company Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

BAG MACHINES
Thomas W. Hall Co., Inc.
Pondevin Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Weber, Herman G.

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
The Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BEARINGS
Black-Clawson Company
Jones, E. D. & Sons Co.
The Manhattan Rubber Mfg. Co.
Montague Machine Works
Railway Bearing Co.
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
SKF Industries Inc.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Woods' Sons Company

BEATERS & JORDANS
The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Herman Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BELTING
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
J. E. Rhoads & Sons
United States Rubber Co.
T. B. Wood's Sons Company
Worthington Pump & Machinery Corp.

BLEACHING APPARATUS
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
Pennsylvania Salt Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company
Valley Iron Works Co.

BOTTOMS
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.

CALENDERS
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

CASTINGS
Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Fort Pitt Steel Casting Co., Div. H. K. Porter Company, Inc.
The Frederick Iron & Steel Co.
Grinnel Company
Hamblet Machine Co.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Magnus Metal Corp.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Smith & Winchester Mfg. Co.
Traylor Engineering & Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross J. O. Eng. Co.
Shartle Brothers Machine Co.

CHEMICALS
Aktivin Corporation
Amer. Cyanamid & Chem. Corp.
Ansul Chemical Co.
Calco Chemical Co.
Diamond Alkali Co.
Dispersion Process Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Geigy Co., Inc.
Gottesman & Co.
Hooker Electrochemical Company
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
The Neville Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S. Rubber Co.
Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Stauffer Chemical Company
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemicals Corp.

CLEANING MATERIALS
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
E. I. du Pont de Nemours & Co., Inc.
Oakite Products, Inc.
Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Nichols Engrg. & Research Corp.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp.
J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Stearns Magnetic Mfg. Co.
Valley Iron Works Co.
T. B. Wood's Sons Company

COATING MACHINERY
Hudson Sharp Machine Company
Moore & White Co.
Pondevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machinery Corp.

CONSULTING ENGINEERS
W. H. L. D. Betz
Frederic C. Clark
W. R. Cliffe
Ferguson, Hardy S.
Hardy, George F.
Johnson & Wierk, Inc.
The Kohler System Company
L. I. M. E.
Merritt-Chapman & Scott Corp.
Main, Inc., Chas. T.
J. E. Sirrine & Co.
Stone & Webster Engrg. Corp.

CONVEYORS
Black-Clawson Company
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

CORES
Elizman Paper Co.
Sonoco Products Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Walker-Goulard-Plecha Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
The Frederick Iron & Steel
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Mfg. Co.
T. B. Wood's Sons Company

CUTTERS
Thomas W. Hall Co.
Noble & Wood Mach. Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DE-INKING
Kinsley Chemical Co.

DIGESTERS
The Biggs Boiler Works Co.
H. K. Porter Company Inc.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Shartle Brothers
United States Rubber Co.
Westinghouse Electric & Manufacturing Company

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, J. O. Engineering Corp.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric & Manufacturing Company

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EVAPORATORS
Black-Clawson Company
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Traylor Engineering & Mfg. Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Merrick Scale Mfg. Co.
Leeds & Northrup
Traylor Engineering Co.
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co. Inc.
Draper Bros. Corp.
Fitchburg Duck Mills
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Woodward, Baldwin & Co.

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
International Pulp Co.
W. H. Loomis Talc Corp.
Union Talc Co.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Moore & White Co.
J. O. Ross Engrg. Corp.
Worthington Pump & Mchy. Corp.
Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Kemp, W. F., Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
Robinson, C. P.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

WHERE TO BUY

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Covel-Hanchett Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Valley Iron Works Co.
Worthington Pump & Mchy Corp.

HOISTS
Appleton Machine Co.
Dilts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

INSTRUMENTS, TESTING AND MEASURING
W. H & L. D. Betz
N. P. Bowsher
The Foxboro Company
General Electric
W. & L. E. Gurley
Leeds & Northrup Company
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B. F. Perkins & Son
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Westinghouse Electric & Manufacturing Company
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Appleton Machine Co.
Behr Brothers Mfg. Co.
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Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
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Hamblet Machine Co.
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LABORATORY EQUIPMENT
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General Electric Co.
Ingersoll-Rand Co.
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Shartle Brothers Machine Co.

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United States Rubber Co.

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Moore & White Co.
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J. J. Ross Company
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PAPER MACHINE SLICES
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Montague Machine Co.
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Valley Iron Works Co.

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Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

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Murray, D. J., Mfg. Co.
Moore & White Co.
Poodevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

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Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

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Crane Company
Grinnell Company
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Taylor Forge & Pipe Works
Walworth Company
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Klemp, W. F., Co.
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The Richardson Economy Plug Co.
Shartle Brothers Machine Co.

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Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer C.

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Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

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Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
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Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
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Shartle Brothers Machine Co.
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Worthington Pump & Machinery Corp.

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Pusey & Jones
Ross Engineering Corp. J. O.
Valley Iron Works Co.

RECTANGULAR BINS
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Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
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Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

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Shartle Brothers Machine Co.
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Sinclair Co.
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Stearns Magnetic Mfg. Co.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

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Poodevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
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Weber, Herman C.

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Magnus Metal Corp.
Morey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

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Langston Co., Samuel M.
Moore & White Co.
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Rotogravure Engrg. Co.
J. J. Ross Company
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Waldron Corp., John

SPRAY NOZZLES
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Clinton Co.
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Stauffer Chemical Company
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Witco Chemical Company

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International Talc Company

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H. K. Porter Company Inc.
Rodney Hunt

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Traylor Engineering & Mfg. Co.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

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Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

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Shartle Brothers
Valley Iron Works Co.

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Westinghouse Electric & Manufacturing Company
Worthington Pump & Machinery Corp.

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Rotogravure Engrg. Co.
J. J. Ross Company
Shartle Brothers Machine Co.

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Dilts Machine Works
The Foxboro Company
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Magnus Metal Corp.
D. J. Murray Mfg. Co.
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William Powell Co.
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Shartle Brothers Machine Co.
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

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Union Machine Co.
Union Screen Plate Co.

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Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

WAXING MACHINERY
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Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

WELDING EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Company
Walworth Company
Westinghouse Electric & Manufacturing Company

WET MACHINES
Black-Clawson Co.
Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
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Shartle Brothers Machine Co.
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Valley Iron Works Co.

WINDERS AND REWINDERS
Black-Clawson Company
Cameron Machine Co.
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Downingtown Mfg. Co.
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The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

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[PUMP TIPS FROM ALLIS-CHALMERS — ONE IN A SERIES]

How to make BEARINGS Last Longer . . .

ONE OF THE MAIN CAUSES of bearing trouble is misalignment. For when pump and its driving motor are not correctly aligned, every revolution of the shaft throws tremendous extra load on all moving parts within the pump's closely fitted body — resulting in greatly accelerated wear, oftentimes in complete bearing failure.

In an effort to eliminate the misalignment factor, A-C developed, for many applications, the "Electrifugal" pump — in which both motor and pump impeller are mounted on one shaft and in one frame. This *unit-design* prevents shaft from getting out of line . . . minimizes possibility of excessive bearing wear.

However, many pumps in use today are coupled to *separate* driving motors. In guarding against misalignment in this type pump, see that coupling flanges are perfectly aligned — and that they're kept that way!

Allis-Chalmers "Electrifugal" Pumps are equipped with two large ball bearings which support *both* the rotor and runner on one shaft.

Regardless of whether your pumps are equipped with ball, roller or sleeve bearings, here are a few maintenance tips that can prove useful to you in getting longer life out of bearings:

▸ Although too much oil won't harm sleeve bearings, too much grease in anti-friction type bearings will *promote* friction and heat. Main job of grease in anti-friction bearings is to protect steel elements against corrosion, not friction.

▸ No one rule on lubrication frequency fits all pump installations. So play safe: if anything, change lubricant *before* it's too worn or too dirty.

▸ Once a month, check bearing temperatures with a thermometer . . . *not by hand.*

▸ In the case of sleeve bearings, measure bearings for wear every three months, replacing them if wear is excessive. Generally allow two-thousandths of an inch clearance — plus one-thousandth of an inch for each inch of shaft journal diameter.

▸ Every three months, drain lubricant, washing out oil wells and bearings with kerosene. In the case of sleeve bearings, check to see that oil rings are free to turn with the shaft.

▸ If you haven't done so already, send for Allis-Chalmers' *free* "Handbook for Wartime Care of Centrifugal Pumps". Applies to *all* makes of pumps; contains *no* advertising. Contents include: valuable tables of friction losses; handy guide to locating trouble; wartime maintenance schedule. Address your request to ALLIS-CHALMERS MFG. CO., MILWAUKEE 1, WIS.

A 1709

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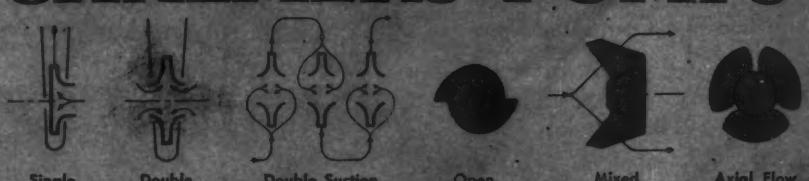
Allis-Chalmers builds all types and variations of pumps shown at right. Capacities from 10 to 150,000 gpm—heads to 2500 lbs.



CURING HIGH OIL TEMPERATURE

ENDS AN OPERATING HEADACHE

SOLNUS OIL . . . Recommended by Sun Engineer,

Reduces Oil Temperature 15 to 20 Degrees, Ends Excessive Sludge Formation

A leading manufacturer of toilet tissue and paper toweling called in a Sun Engineer to investigate the oil circulating system that lubricated five, modern, high-performance paper machines.

A well-known brand of oil was being used, but temperatures were high, and excessive sludge was being formed. After careful study, the Sun Engineer recommended a Solnus oil for paper machines.

Temperatures dropped 15 to 20 degrees, and excess sludge formation stopped. For two years, careful checks were made on the oil, and analyses showed it stood up through extended service periods.

To insure efficient operation of the machines, a special Sun grease is used on the wet end of the machine, and Sun Roller Bearing Grease, as a general gun-grease.

This mill is just one of many that have discovered the road to efficient lubrication with Sun's engineering service. Sun Engineers, experienced in all phases of paper manufacturing, and armed with Sun's carefully refined, quality greases, and oils, stand ready to serve you. Call them in. Or write direct to . . .

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